

Vaping: Not for the Young at Heart **Scaffolds Summary**

This multimodal text set is designed to help middle school learners work toward mastering the grade-level moderately complex **Anchor Text** “[Vaping: Not for the Young at Heart](#)”, adapted from a published study that discusses the cardiovascular risk associated with vaping (Moheimani RS, Bhetraratana M, Yin F, et al., 2017 & Middlekauff, H. R., 2019). This summary suggests scaffolds for diverse learners’ reading and understanding the Anchor Text, and to help address teachers’ instructional goals.

This anchor text and scaffolds address the following standards:

Next Generation Science Standards	ELA Common Core Standards	Mathematics Common Core Standards
6-8.MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. 6-8.MS-LS1-8: Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for the immediate behavior or storage as memories.	RST.6-8.1-3: Key Ideas and Details RST.6-8.4-6: Craft and Structure RST.6-8.7-9: Integration of Knowledge and Ideas RST.6-8.10: Range of Reading and Level of Text Complexity WHST.6-8.1: Write arguments focused on discipline-specific content. WHST.6-8.9: Draw evidence from informational texts to support analysis reflection, and research.	Math.Content.6.RPA: Understand ratio concepts and use ratio reasoning to solve problems. Math.Content.6.EE.C: Represent and analyze quantitative relationships between dependent and independent variables. Math.Content.6.SPA.A: Develop understanding of statistical variability. Math.Content.6.SPA.B: Summarize and describe distributions. Math.Content.7.SPA.A: Analyze proportional relationships and use them to solve real-world and mathematical problems. Math.Content.7.SPA.A: Use random sampling to draw inferences about a population. Math.Content.8.SPA.A: Investigate patterns of association in bivariate data. Math.Content.8.F.B: Use functions to model relationships between quantities.

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Science Scaffolds

Science Content Scaffolds		
Scaffold	Level	Description
One e-cigarette with nicotine leads to adrenaline changes in nonsmokers' hearts <i>American Association for the Advancement of Science: EurekaAlert!</i>	N/A	Video and Text: Interview with Dr. Middlekauff about the study described in Anchor Text.
How Nicotine Affects the Teen Brain <i>National Institute on Drug Abuse and Scholastic Inc.</i>	Grades 6-12	Lesson Plan: Lesson that addresses the effects of nicotine on the brain.
Teens and Vaping: The Real Health Consequences <i>U.S. Food and Drug Administration</i>	Grades 6-12	Lesson Plan: Lesson that includes students identifying evidence from multiple texts about vaping health risks.
Nicotine Addiction <i>Stanford Medicine</i>	Grades 6-8	Lesson Plan: 3 Lessons that address the brain, addiction, and nicotine addiction. Includes slides, activities, and discussion guides.
The Dangers of Vaping <i>Scholastic, Inc. and National Institute on Drug Abuse</i>	N/A	Interactive Infographic: Explains the different effects of vaping on the body and environment.
The Health Impacts of E-Cigarettes <i>Scholastic, Inc.</i>	Grades 6-12	Article: Explains the health impacts of vaping.
Heart Risks Seen in Regular Vapers <i>Society for Science & the Public: Science News for Students</i>	810L – 1000L	Text: Discussion with Dr. Middlekauff about study in Anchor Text.
Investigating smoking behavior <i>University of Washington Department of Genome Sciences: Genomes Sciences Education Outreach</i>	Grades 8-12	PP and Inquiry: Exploring ethical issues in clinical studies of smoking
Critically thinking about a nicotine addiction study <i>National Institutes of Health</i>	Grades 6-8	Lesson Plans: To help understand clinical studies similar to Anchor Text
Vaping may stiffen the heart and blood vessels	810L – 1000L	Texts: How studies in mice model/extend clinical study described in Anchor Text.

Vaping may threaten brain, immunity and more <i>Society for Science & the Public: Science News for Students</i>	1010L – 1200L	
How Coronavirus rampages through the body <i>American Association for the Advancement of Science: Science Magazine</i>	Grades 6-12	Video: Description of coronavirus effects on body systems
How Vaping Nicotine Can Affect A Teenage Brain <i>NPR</i>	1210-1400L	Audio and Text: The effects of vaping on the teenage brain
Make a mad-mad-mad Neuron <i>University of Utah</i>	Grades 6-12	Interactive Game: Anatomy of a neuron
Human Body: Nervous System <i>Carolina Biological Supply Company</i>	N/A	Infographic: Explains the function of the nervous system
Cardiovascular Diseases <i>Carolina Biological Supply Company</i>	N/A	Activity/Card Sort: Matching heart and EKG images to cardiovascular diseases and arrhythmias
Nicotine from smoke enters body through skin <i>Society for Science & the Public: Science News for Students</i>	Grades 6-8	Text: Explains new study that found that nicotine can enter the body through the skin
Today's nico-teen addicts: what role for Juuling? <i>Society for Science & the Public: Science News for Students</i>	Grades 6-8	Text and Video with Puzzle and Classroom Questions: Explains how Juuls with high nicotine increase addiction and health risks
Lung disease tied to e-cigarettes <i>Society for Science & the Public: Science News for Students</i>	Grades 6-8	Text and Power Words: Explains the connection between e-cigarettes and lung diseases/risk
Human Body: Respiratory System <i>Carolina Biological Supply Company</i>	N/A	Infographic: Explains the function of the respiratory system
Smoke and Mirrors <i>Engineering University of Colorado Boulder</i>	Grades 5-6	Evidence-based Activity: Focused on how to reduce smoking/vaping

Common Pesticide Makes Migrating Birds Anorexic <i>American Association for the Advancement of Science: Science Magazine</i>	1410L - 1600L	Text: Neonicotinoids effects on birds
Teen Athletes with Even Mild COVID-19 Can Develop Heart Problems <i>Science News for Students</i>	810L – 1000L	Text: Explains the heart complications associated with COVID-19 for teen athletes; Describes the structure and function of the heart and cardiovascular system
COVID-19 Risk Linked to Vaping, But Addicted Kids Find It Hard to Stop <i>Society for Science & the Public: Science News for Students</i>	810L – 1000L	Text: Explains the results of a study linking vaping to COVID-19 risk and discusses quitting vaping
These Free Programs Can Help Teens Seeking to Quit Vaping <i>Society for Science & the Public: Science News for Students</i>	810L – 1000L	Text: Discusses resources and programs that help teens quit vaping
Vaccine Makers Project Journal Club Expert Answers: Vaping The Vaccine Makers Project: The Children’s Hospital of Philadelphia	N/A	Video: Interview with Dr. Brian Jenssen on the dangers of vaping and the epidemic among children
Scientists Say: Nicotine <i>Society for Science & the Public: Science News for Students</i>	810L – 1000L	Text: and Audio: Defines and explains nicotine. Glossary included.

Science Inquiry Content Scaffolds		
Scaffold	Level	Description
Heart Rate and Body Positions <i>Vernier Science Education</i>	Grades 6 - 8	Inquiry Activity: Students measure their heart rate using vernier Go Direct Probe during different body positions and analyze the data.
Planaria Activities Seedap Lessons Investigating the Effects of an Energy Drink on Flatworms How to do Planaria Drug Research Activities in Middle School	Grades 6-8	Inquiry Activities: Resources describe how to conduct a planaria lab to show the effect of nicotine on the nervous system.

Temple University Medicine Rhea Miles & Tonya Little (2019) Jennifer Navarrete, Azion Hyman, and Ashaunti Hyman		
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ELA Scaffolds

ELA Content Scaffolds		
Scaffold	Level	Description
The Tell Tale Heart by Edgar Allan Poe <i>Provided by American Stories – Interesting Things for ESL Students</i>	N/A	Poem and Audio: Poem incorporating human physiology connected to emotions. Includes an audio reading of the poem.
Tobacco Prevention Toolkit: You and Me, Together Vape-Free <i>Stanford Medicine</i>	Grades 6-8	Lesson Plan: 6 lessons that address the dangers of vaping, vaping advertisements, and combating the vaping epidemic. Includes slides, activities, and discussion guides.
Videos of Real Teen Experiences <i>U.S. Food and Drug Administration</i>	Grades 6-12	Videos: Teens telling their experiences with vaping.
The Risks of Vaping Magazine <i>U.S. Food and Drug Administration</i>	Grades 6-12	Lesson Plan: Lesson that addresses the risks of vaping. Includes informational texts and anti-vaping infographic project.
Vaping 101: Must-Know Facts About E-Cigarettes <i>U.S. Food and Drug Administration</i>	Grades 6-12	Videos: Short videos discussing how e-cigarettes work and their harmful effects, the vaping epidemic among teens, vaping advertising, and vaping's evolution.
The Risks of Vaping <i>Scholastic Inc.</i>	Grades 6-12	Magazine: Explains the dangers of vaping, provides real stories from teens, and poster project.
Sizing Up E-Cigarette Marketing <i>U.S. Food and Drug Administration</i>	Grades 6-12	Lesson Plan: Lesson that addresses e-cigarette marketing. Students analyze marketing and create their own anti advertisements.
Is It Worth It? <i>Young Minds Inspired</i>	Grades 6-8	Lesson Plan: Activities that address argumentation, advertising, and campaigning.
Booker Takes a Stand Raven's Home <i>Disney Channel</i>	Grades 6-8	Video: Vaping in the media example – vaping in schools.
Nicotine by Ezra Pound <i>Provided PoemHunter.com</i>	1810L	Poem: An American traditional poem about nicotine addiction.
Silas Marner Chapter 12 by George Elliot	780L	Chapter: An American traditional chapter from a novel that describes the human experience and effect of addiction.

<i>Penguin Random House Publisher</i>		
Beneath a Meth Moon by Jacqueline Woodson	730L	Novel: A contemporary novel that tells the story of a teenager struggling with grief and addiction.
<i>Penguin Random House Publisher</i>		
Because of Winn-Dixie by Katie DiCamillo	670L	Novel: A young girl and her dog collecting stories from her father and townspeople from her new hometown. Some describe the human experience of addiction.
<i>Candlewick Press</i>		
My Brother at 3 A.M. by Natalie Diaz	410L-600L	Poem: A contemporary poem about the human experience of addiction.
<i>Reprinted by Copper Canyon Press</i>		
Neuroscience Haikus	N/A	Activity: Creating haikus that incorporate neuroscience vocabulary and concepts
<i>BrainFacts.org – Emma Lindberg</i>		
Vaping Cartoon	N/A	Cartoon: Cartoon about the effects of vaping in comparison to smoking cigarettes.
<i>Mike du Jour by Mike Lester</i>		
Black Lives Black Lungs	N/A	Films, Slideshow, and Discussion Guide: A series covering the influence of tobacco industry on Black Americans.
<i>Lincoln Moody and the Truth Initiative</i>		
Heart to Heart by Rita Dove	7 th Grade	Lesson: Text, activities, paired texts, related media, and teacher guide for the poem describing the heart.
<i>CommonLit</i>		
Potawatomi Story	810L – 1200L	Short Story: A short story about the role tobacco plays in the Potawatomi Tribe.
<i>Adapted from Alanson Skinner</i>		
How They Brought Back the Tobacco: A Traditional Cherokee Story	1210L – 1400L	Short Story: A short story about the role tobacco plays in the Cherokee Tribe.
<i>Virginia Drywater-Whitekiller in Cultural Survival Quarterly Magazine</i>		
How Gluskabe Stole Tobacco	410L – 600L	Short Story: A short story about the role tobacco plays in the Abenaki Tribe.
<i>Native Languages of the Americas</i>		
Nawakosis: A Blackfoot Legend	410L – 800L	Short Story: A short story about the role tobacco plays in Native Americans Tribes.
<i>Native Languages of the Americas</i>		
First People and the First Corn	610L – 800L	Short Story: A short story about the role tobacco plays in Native Americans Tribes.
<i>Glenn Welker – Indigenous Peoples' Literature</i>		
The Coming of Corn	1210L – 100L	Short Story: A short story about the role tobacco plays in Native Americans Tribes.
<i>Sauk leader Black Hawk (Ma-ka-tai-me-she-kia-kiak) – Native Languages of the Americas</i>		
The Absolutely True Diary of a Part-Time Indian by Sherman Alexie	600L	Novel and Teacher Guide: A young boy's story about growing up on a reservation.

<i>Scholastic Teacher Guide</i>		
Denali Dreams by Logan Brown	N/A	Picture Book: A young girl's story about resisting cigarettes
<i>Truth Initiative</i>		
Impact of Tobacco Advertising (SRITA) collection	N/A	Advertisements: Collections of e-cigarette and other tobacco products advertisements
<i>Research into the Impact of Tobacco Advertising - Stanford University</i>		

ELA Instructional Scaffolds		
Scaffold	Level	Description
Dissecting a Scientific Article <i>Arizona State University – Ask a Biologist</i>	Grades 6-8	Interactive Article: Describes how to dissect scientific articles and guides step-by-step through an example article.
Anatomy of an Article <i>Arizona State University – Ask a Biologist</i>	Grades 6-8	Article: Explains each part of a scientific article.
Rolling Journal <i>Student Achievement Partners. Achieve the Core. Text set project: Building knowledge and vocabulary.</i>	N/A	Rolling Journal Strategy: Students utilize the journal to synthesize information from multiple sources.
Think Aloud <i>Linking Science & Literacy for All Learners</i>	Grades 6-8	Think Aloud Strategy: Outlines protocol for modeling a scientific text think aloud.
Word Tournament <i>STEM Literacy Project</i>	Grades 6-8	Word Tournament Strategy: Build vocabulary instruction and review and/or summarize learning.
Using the Jigsaw Cooperative Learning Technique <i>Read Write Think - NCTE</i>	Grades 3-8	Article: Explains how to differentiate instruction using the jigsaw strategy.
CER – Claim Evidence Reasoning <i>Bozeman Science</i>	Grades 6-8	Video: How to use CER for scientific argumentation.
Claim Evidence Reasoning Graphic Organizer <i>Gallagher, K. (2011)</i>	Grades 6-8	Graphic Organizer: Guides students through the CER Framework.
Argumentative Frames – A Planning Guide for Students	Grades 6-8	Graphic Organizer: Guide to plan argument with claim, evidence, and reasoning.

<i>Linking Science & Literacy for All Learners</i>		
The Multidimensionality of Children's Picture Books for Upper Grades Chapter 15: "Using Picture Books with Older Learners" A How-to Guide for using Picture Books with Older Students Sample Lessons from Read Write Think - NCTE <i>Susan R. Massey</i> <i>Martinez et al.</i> <i>Pernille Ripp</i> <i>Fresch & Harkins</i>	Grades 6-8	Picture Books: Rationales and sample lessons that you can use to support picture book use in your classrooms for this and all anchor texts.

Mathematics Scaffolds

Mathematics Content Scaffolds		
Scaffold	Level	Description
Product, Substance-Use, and Demographic Characteristics of Hospitalized Patients in a Nationwide Outbreak of E-cigarette, or Vaping, Product Use—Associated Lung Injury <i>Center for Disease Control and Prevention</i> <i>Activity from Kayla Hogenmiller</i>	Grades 6-8	Analyzing Data Activity: The CDC provides data (e.g., types of vaping products used) about hospitalized patients with lung injuries. Scaffold activities with this data may consist of: - Students analyzing, interpreting, and discussing the data and representations provided AND using CER to create an argument - Students creating their own representations of the data
Comparing Vaping Demographics <i>Data from Center for Disease Control and Prevention, New York Times</i> <i>Activity from Jeannie Sneller</i>	Grades 6-8	Comparing Ratios Activity: Students use ratios to compare two quantities and represent the comparisons. This activity has students dig deeper into who is vaping and who is getting sick from vaping.
Using Evidence to Make Claims About Age-Specific E-Cigarette Use <i>Data from New York Times</i> <i>Activity from Jeannie Sneller</i>	Grades 6-8	Analyzing Data Activity: Students analyzing, interpreting, and discussing the E-Cigarette data and representations provided AND using CER to create an argument
Asking Questions: Vaping Data & Statistics <i>Desmos Classroom</i> <i>Activity from Dee Leible</i>	Grades 6-8	Statistical Questions Activity: Students engage in an interactive Desmos activity that prompts them to create statistical questions and a plan for answering them. The activity teaches the students about statistical questions, data, and variables. Students answer the following questions about vaping: - What statistical information can we collect from teen vaping? - How could we measure it? - How can we show that information?
Shape of Data: Vaping Data & Statistics <i>Desmos Classroom</i> <i>Activity from Dee Leible</i>	Grades 6-8	Shapes of Data Distributions Activity: Students engage in an interactive Desmos activity that prompts them to describe the shapes of data sets using vaping statistics. The activity teaches the students about data distributions, sample, and population. Students answer the following questions about vaping: Which graphs make the best pathway for communication of the data?
Shape and Measure of Data: Vaping Data & Statistics <i>Desmos Classroom</i>	Grades 6-8	Central Tendencies Activity: Students engage in an interactive Desmos activity that prompts them to describe the connection between the shape of data and the mean and median. The activity teaches the students about data distributions and central tendencies.

Activity from Dee Leible		
Age-Specific E-Cigarette Use & Lung Injury Data from New York Times Activity from Jeannie Sneller	Grades 6-8	Analyzing Data Activity: Students analyzing, interpreting, and discussing the E-Cigarette data and representations provided AND using CER to create an argument

Mathematics Instructional Scaffolds		
Scaffold	Level	Description
Slow Reveal Graphs Slowrevealgraphs.com	Grades 6-8	Interpreting Data Activity: Show students a graph without the features (e.g., title, axis labels, legends). Discuss what students notice, wonder, and what they think the data may represent. Then, slowly reveal the graph features one by one. After each reveal, continue to discuss what students notice, wonder, and what they think the data may represent. Once the graph is fully revealed, interpret the graph and discuss the purpose of graph features.
Understanding Two Way Frequency Tables Activity from Kayla Hogenmiller	Grades 6-8	Two Way Frequency Tables Activity: Complete the following steps: • Give students a completed two way table to observe and compare. Use something of INTEREST to your students so they can visualize the story that the numbers provide for them. • Discuss the connections between the first columns with the last. • Discuss the connections between the first rows and the last. • Discuss the types of questions that had to be asked to get this information. • Have students complete a two way table with missing information/numbers. Discuss the types of questions that had to be asked to get this information. • Build their own surveys to ask their class. Use that data to complete their own two way table.
Vaping Research Project U.S. Food and Drug Administration	Grades 6-8	Data & Statistics Lesson Plan: Investigation requiring students to collect and present data about vaping knowledge and attitudes.
Product, Substance-Use, and Demographic Characteristics of Hospitalized Patients in a Nationwide Outbreak of E-cigarette, or Vaping, Product Use–Associated Lung Injury Center for Disease Control and Prevention Activity from Kayla Hogenmiller	Grades 6-8	Analyzing Data Activity: The CDC provides data (e.g., types of vaping products used) about hospitalized patients with lung injuries. Scaffold activities with this data may consist of: • Students analyzing, interpreting, and discussing the data and representations provided AND using CER to create an argument • Students creating their own representations of the data

Comparing Vaping Demographics <i>Data from Center for Disease Control and Prevention, New York Times</i> <i>Activity from Jeannie Sneller</i>	Grades 6-8	Comparing Ratios Activity: Students use ratios to compare two quantities and represent the comparisons. This activity has students dig deeper into who is vaping and who is getting sick from vaping.
Using Evidence to Make Claims About Age-Specific E-Cigarette Use <i>Data from New York Times</i> <i>Activity from Jeannie Sneller</i>	Grades 6-8	Analyzing Data Activity: Students analyzing, interpreting, and discussing the E-Cigarette data and representations provided AND using CER to create an argument
Asking Questions: Vaping Data & Statistics <i>Desmos Classroom</i> <i>Activity from Dee Leible</i>	Grades 6-8	Statistical Questions Activity: Students engage in an interactive Desmos activity that prompts them to create statistical questions and a plan for answering them. The activity teaches the students about statistical questions, data, and variables. Students answer the following questions about vaping: • What statistical information can we collect from teen vaping? • How could we measure it? • How can we show that information?
Shape of Data: Vaping Data & Statistics <i>Desmos Classroom</i> <i>Activity from Dee Leible</i>	Grades 6-8	Shapes of Data Distributions Activity: Students engage in an interactive Desmos activity that prompts them to describe the shapes of data sets using vaping statistics. The activity teaches the students about data distributions, sample, and population. Students answer the following questions about vaping: • Which graphs make the best pathway for communication of the data?
Shape and Measure of Data: Vaping Data & Statistics <i>Desmos Classroom</i> <i>Activity from Dee Leible</i>	Grades 6-8	Central Tendencies Activity: Students engage in an interactive Desmos activity that prompts them to describe the connection between the shape of data and the mean and median. The activity teaches the students about data distributions and central tendencies.
Age-Specific E-Cigarette Use & Lung Injury <i>Data from New York Times</i> <i>Activity from Jeannie Sneller</i>	Grades 6-8	Analyzing Data Activity: Students analyzing, interpreting, and discussing the E-Cigarette data and representations provided AND using CER to create an argument
Part I: Exploring the Data Representations in the Anchor Text Part II: Collecting and Interpreting Your Own Data <i>Activity from Kayla Hogenmiller</i>	Grades 6-8	Part I Analyzing Data Activity: Students analyze the data representations in the Anchor text by: • Observing the graphs in the article. • Discussing the pieces of the graph without the data (title and axis labels) • Discussing how the data is presented (units) • Ask the students to tell the story that the data displays. • Ask students to discuss ideas they deem as missing information.

		• Provide a specific questions that will yield the data they feel like they need. Part II Collecting and Interpreting Data Activity: Students answer the following questions. Then, they create a Google Form to collect data from their peers. Next, they interpret the data, represent the data, and share the data with their peers. • If you wanted to collect data to create a graph like the one in the Anchor Text, what questions would you ask? • What information would you collect with that question? • How do you present that data? • What information would you like to know about your student body and vaping? • What questions would you ask? • How can you present this data?
Collecting and Interpreting Your Own Data <i>Activity from Kayla Hogenmiller</i>	Grades 6-8	Collecting and Interpreting Data Activity: Complete the following steps: • Have students read 49 Vaping Statistics (<i>Cross River Therapy</i>) and The US and UK See Vaping Differently. Here's Why (CNN). • Students complete the following activity: ○ Write and develop equations for the nicotine intake for a person in the UK and a person in the US. Graph them on Google Sheets, Excel, or another resource. Compare the amounts of nicotine after just 7 pods, 28 pods. What do you realize? • Students answer the following questions. Then, they create a Google Form to collect data from their peers. Next, they interpret the data, represent the data, and share the data with their peers. ○ What kind of vaping information would you like to gather from students in your school? ○ What questions would you ask to obtain that information? ○ How would you display that information? ○ Think of other ways to display the information without using percents.
How Fast Are You? <i>Huey et al. (2017) - The American Statistical Association</i>	Grades 6-8	Lesson: Measures of Center and Spread, including mean absolute deviation
12 Engaging Activities for Mean Absolute Deviation <i>Math Idea Galaxy</i>	Grades 6-8	Activities: 12 Mean Absolute Deviation activities
Fizzy Juice <i>Illustrative Mathematics – National Council of Teachers of Mathematics</i>	Grades 6-8	Activity: Introduction to ratios

Exercise Away the Big Mac: Ratios, Rates, and Proportions in Context <i>Ozgun-Koca et al. (2013)</i> <i>Website has free access with login:</i> <i>Read online free</i>	Grades 6-8	Activity: Ratios, rates and proportions
Reading and Interpreting Data <i>Victoria State Government – Department of Education</i>	Grades 6-8	Activity: Reading and interpreting graphs and tables
Twizzler Lab <i>Activity Created by Dee Leible</i>	Grades 6-8	Activity: Students measure twizzlers after bites, record and graph the data, and analyze the relationship. This helps them define independent and dependent variables.
Interpretations of Boxplots: Helping Middle School Students to Think Outside the Box <i>Edwards et al. (2017)</i> <i>Journal of Statistics Education</i>	N/A	Practitioner Article: Provides ways to support middle school students interpret box plots

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