

## AP Research Summer Thinking

Ms Pronko 2024-2025

*Congratulations on signing up for AP Research! Many students find it super fun and rewarding; however, you need to know that it will take up some time and headspace. Make sure the rest of your schedule allows for that. A study hall is **HIGHLY** recommended so that you have flexibility to meet with people and/or conduct your research. For you to pick a project that you are going to love, you will need to do some thinking over the summer. To that end, please complete the steps below.*

1. **Sources:** Familiarize yourself with at least four publications on several topics that interest you. These can include podcasts, journals, periodicals, videos, etc. Keep a list of potential research ideas, good publications, and names of researchers in that academic discipline. Spend a little time regularly reading Wikipedia or other sources for background knowledge, too.

2. **Experimental design:** Work through the links below; read and/or watch the relevant videos. Take notes in such a way that you can clearly explain the content to someone else. On your power point slide, choose one concept addressed and clearly explain it via your slide.

a. <https://libguides.newcastle.edu.au/researchmethods>

b. <https://methods.sagepub.com/>

c. <https://www.youtube.com/watch?v=RZcfmA1l6cE>

3. **Identifying and understanding components of research:** Watch the first video below and then choose 4-5 short videos from the second link from NSF (or something similar) to watch on topics that interest you. Practice identifying the research question, the data collection method, and the strongest finding.

a. <https://www.youtube.com/watch?v=fZ-LGZdqWLU>

b. <https://www.youtube.com/c/VideosatNSF/videos>

4. **Mental models:** Discover and reflect on mental models in general starting here:

<https://fs.blog/mental-models/>.

Mental models can help us shape our thinking when tackling a complex problem. Before step 5, check out the website and read through the mental models that pertain to the academic discipline you are most interested in. Take note of any that make you stop and think or that make your heart go pitter patter.

5. **Mental models in books:** The books below make use of mental models as they investigate topics with many avenues for exploration. Reading a book will also allow you a more comprehensive look into a specific topic of interest than journal articles will. These books should be available from the public libraries, or I may have a copy I can lend you. Choose and read one book in a field of interest for you. There is no need to take specific notes while reading. You might use a sticky note or two to flag a particularly remarkable section, or you may want to jot down ideas about topics or particular terms of interest. In the fall, you will lead a casual book talk/discussion about what you found notable.

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## What to bring to class after the summer:

- A. **Create a short power point presentation (preferably Google slides, Canva, or M365, which can be shared with me). Five - seven slides should be sufficient. Don't crowd them; make choices instead. Include the following:**
1. A list of favorite sources and the research topics/ideas they've helped you generate. This can be a simple table.
  2. Notes on research design, including types of and any questions you have. Keep it basic.
  3. A description of your favorite NSF video and a brief identification or description of the specific research question, hypothesis, data collection method, and findings. (This might require 2 slides.)
  4. An explanation of an interesting mental model and how you think it could be applied.
- B. Bring in **the book** you chose to read from the list below and **any notes** from it (no slides necessary for this). It will be helpful to choose a book from an academic discipline you are interested in (e.g. biology, history, linguistics, psychology, etc), which might spark an idea for a research project.

## Book suggestions containing mental models:

### General/Statistics/Data/Tech

*The Signal and the Noise* by Nate Silver

*Everybody Lies: Big Data, New Data, and What the Internet Can Tell Us About Who We Really Are* by Seth Stephens

*Invisible Women* by Caroline Criado-Perez

*More than a Glitch- Confronting Race, Gender, and Ability Bias in Tech* by Meredith Broussard

### Psychology/Linguistics

*Thinking, Fast and Slow* by Daniel Kahneman

*Superforecasting* by Philip Tetlock

*Drunk Tank Pink* by Adam Alter

*Nabokov's Favorite Word is Mauve* by Ben Blatt

*Situations Matter* by Sam Sommers

*The Man Who Mistook His Wife for a Hat and Other Tales* by Oliver Sacks

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*Whistling Vivaldi* by Claude Steele

*Predictably Irrational: The Hidden Forces That Shape Our Decisions* by Dan Ariely

*Beyond Trans: Does Gender Matter?* by Heath Fogg Davis

*Think Again: The Power of Knowing What You Don't Know* by Adam Grant

*Saving Time – Life Beyond the Clock* by Jenny Odell

### Education

*The Teachers – A Year Inside America's Most Vulnerable Profession* by Alexandra Robbins

### Politics/History/Sociology/Economics

*Stamped from the Beginning* by Ibram X Kendi

*The Sum of Us: What Racism Costs Everyone*, by Heather McGhee

*Freakonomics* by Steven Levitt & Stephen J. Dubner

*Think Like a Freak* by Steven Levitt & Stephen J. Dubner

*Poverty by America* by Matt Desmond

*Young and Restless – Girls who sparked America's Revolution* by Mattie Kahn

*The Tipping Point* by Malcolm Gladwell\*

*Flash Boys* by Michael Lewis\*

*The Island at the Center of the World: The Epic Story of Dutch Manhattan and the Forgotten Colony that Shaped America* by Russell Shorto

*Alexander Hamilton* by Chernow

### Physical Sciences

*Alchemy of the Air* by Thomas Hager

*A Brief History of Time* by Stephen Hawking

*Six Easy Pieces* by Richard Feynman

*The Extended Mind: The Power of Thinking Outside the Brain*, by Annie Murphy Paul

*Finding the Mother Tree: Discovering the Wisdom of the Forest*, by Suzanne Simard

*Food and Climate Change Without the Hot Air* by Sarah Bridle

<https://earth.org/climate-change-books/> (make sure you are thinking mental models)

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### **Arts/Design**

*Musicophilia: Tales of Music and the Brain* by Oliver Sacks

*The Design of Everyday Things* by Don Norman

*A Whole New Mind: Why Right-Brainers Will Rule the Future* by Daniel Pink

\*These books are much more narrative than scientific