STS 4500 Whiteboard Exercise

No whiteboard actually needed – any piece of paper big enough to brainstorm on is fine. Bigger space is always great for brainstorming though!

You will need:
1. Something to write with
2. Something to write on

The goal of this exercise is to help you with the two hardest parts any research project – knowing what to search for, and where to search to find it.

The exercise has 5 parts and it works however you want to structure your brainstorming – a list, concept map, categories, etc. The goal is to just write out each step so that you end with a research plan.

Feel free to repeat this exercise as many times as you need! Research is a reiterative process. By the time you’ve done some research and reading, you’ll probably have more questions. So you can always check in with your soon-to-be-honed research question and see what else you need to find.

Step 1. Your Topic!

Start by writing down your topic/research question/area of interest/whatever.

It doesn’t matter how broad or narrow your subject is right now. This will help you whether you know exactly what you’re writing about or if you only have a general idea.

Ex. Do Genetically Modified Organisms (GMOs) threaten biodiversity?

Step 2. Break it down!

In any topic or research question, you will find a lot of smaller questions. There are a lot of little things that you have to answer that will build up to your overarching research question.

Break your topic down into as many smaller questions as you can think of.
Ex. Do Genetically Modified Organisms (GMOs) threaten biodiversity?

- How do you define Genetically Modified Organisms (GMOs)?
- What does the label GMO apply to?
- Does anyone oversee/regulation GMOs?
- How do you define biodiversity?
- Has there ever been a case of GMOs harming biodiversity?
- What is the current possible risk to biodiversity?
- How likely is it that GMOs will threaten biodiversity?
- What are possible solutions?
- Who is charge of monitoring GMOs for possible biodiversity issues?
- How is biodiversity measured?
- What do experts in the field of GMOs feel about the issues around biodiversity?

Each of these questions is something that you need information to answer. First hard part of research is conquered! You know what information you need to find

*Hint: Common Knowledge*

The definition of common knowledge depends entirely on your audience. That makes it really tricky because your audience will change with everything you write so the definition will constantly change.

If your audience is diverse, you have to adjust and explain more things because someone reading might not be familiar with your topic. But, if it’s a group of folks in your major/discipline, then you all have a common educational experience, you know common information, and you can assume that they know more of the basics.

For the STS Thesis, your audience is any undergraduate at UVA. So keep the Arts/Humanities folks in mind and explain the science-y stuff for them.

For the Technical/Capstone, your audience is just others in your major. Common knowledge is much easier there.

**Step 3 – What type of resource: BEAM**

The next hard part requires knowing where to go for the information that you need. Searching selectively by linking what you need with the best resource will save you a ton of time.

You need to consider what type of resource that you need. That’s where BEAM comes in. It’s a way of thinking about different types of information. (It’s also much easier to wrap your head around than primary, secondary, and tertiary although that’s basically what this is).

You’ll want to label each question based on the categories BEAM lays out. But first, BEAM stands for...
Background
This is the general information about a topic. You may need this for a variety of reasons - you're starting your research, you need to know more about a topic that you don't know a whole lot about right now, or you could be looking for sources to use to lay out the basics for your reader. Introductory books, encyclopedias, almanacs, textbooks, reference materials, statistical abstracts, etc. all fall into this category.

Evidence
Frequently, you'll need to go to the source and find specific cases, studies, raw data, or examples of your topic. This type of information could be a lot of things - newspaper articles, tweets, letters, photographs, datasets, census data, congressional proceedings, case studies, technical reports, scholarly research articles, conference proceedings... and more!

Argument
This type of information is where you get into what scholars and experts in a discipline are concerned about and actively discussing the evidence above. Don't be surprised if you find far more than you'd expect! Scholars are interested in everything so you'll find articles on topics from health care to Beyoncé to social robots to comic books. This category leans more scholarly because that's where expert publish the bulk of their work but that is not the only place! Scholars talk about their work all over so be open to looking for scholarly articles as well as conference proceedings, newspaper articles, interviews, tweets, blog posts, opinion pieces, and anything else where an expert might want to publish their discussions.

Method
Resources for the method will introduce you to ways of analyzing your topic and your overall research. For these resources, you can often look at similar research to see how other scholars structured their work. Your STS Professor is going to be a great resource for this type of information.

Ex. Continuing our example, I've added a BEAM note in [] next to each of the mini questions:

- How do you define Genetically Modified Organisms (GMOs)? [B]
- What does the label GMO apply to? [B]
- Does anyone oversee/regulation GMOs? [B]
- How do you define biodiversity? [B]
- Has there ever been a case of GMOs harming biodiversity? [E]
- What is the current possible risk to biodiversity? [A]
- How likely is it that GMOs will threaten biodiversity? [E or A]
- What are possible solutions? [E or A]
- Who is charge of monitoring GMOs for possible biodiversity issues? [B]
- How is biodiversity measured? [M]
- What do experts in the field of GMOs feel about the issues around biodiversity? [A]

You’ll notice that some fall into two categories. That’s happens. You’ll never know for sure before you’ve started searching. If the evidence and research exists, great! If there isn’t definitive evidence for your particular topic, you might have to rely on the expertise of various scholars in the field. Both are valid options.
Step 4: Who will care about this?

The next thing to consider is which group or discipline would care to do work related to your subject.

Pairing what type of resource with a discipline will lead to where you need to search and will raise your likelihood of having a successful search.

Ex. For almost all of the questions on GMOs and biodiversity, a good biology or environmental science resource would be a great start. For the questions on regulations of GMOs, you’d probably check in with a federal government resource like the FDA, USDA, or EPA as start and then look for studies about how successful their programs are for GMOs.

Hint: Scope
It’s always much, much easier to start with a topic/research question that’s really narrow. If you find that you don’t have enough to write about, you can always easily widen your scope and add more. But it is incredibly difficult to start with something massive and narrow down. It’ll be overwhelming and frustrating. Be kind to yourself! If you can either start with something really specific or begin searching with the idea that you’re looking for something to focus on, you’ll be far more successful and less stressed about this process.

I purposely picked a really big example topic. It’s too big. You might be able to thoroughly cover this topic in a book but certainly not a thesis. This is more of an exploratory example where you would start by looking for options to narrow your focus.

   You could look just at the United States.
   Inside a specific industry that uses GMOs like agriculture. Or even more narrowly just industrial agriculture!
   Really love potatoes? (who doesn’t!)
   Do GMOs potato plants used in industrial agriculture threaten the biodiversity of potatoes produced in United States?

Now that’s a research question that you can focus on!

And also because you clearly have to know, the answer is yes - the demand for the Idaho-variety potatoes is so great that the bulk of all industrial agriculture production of potatoes is just that specific variety and many expects fear that other varieties of potato are threatened as a result. There’s potato research on that!

Step 5: Finding a specific search engine

At this point, you have a list of:
1. What piece of information you need the answer for
2. What type of source you need to find
3. And which group is most likely to write about that information
Now you just have to pick somewhere to search. And that’s where the UVA Library and librarians come in.

You can always start with a general, multidisciplinary search engine like:
  Google Scholar
  Virgo *
  Academic Search Complete

These resources will give you an introduction into resources written on a topic from a variety of disciplines. They’re fantastic starting places and are really helpful if you’re exploring with an eye toward narrowing your topic down.

*This is your additional reminder that Virgo doesn’t search everything!

Catalog Search = everything the library owns or entire volumes of online materials
For online resources, the catalog lists the entire title. You can’t search inside a journal but you can see if we subscribe to it, and see what databases provide access to which publication dates of that journal.

Article Search = searches 15 out of 547 databases! That alone is not a great percentage AND(!) Virgo cannot access any of the core science or engineering databases.

Once you need subject specific materials, you’ll need to start searching disciplinary specific databases. There are a lot of them but the UVA librarians have created guides to the Library’s resources by subject and discipline.

Subject Guides

If you have no idea where to search or you’re just not sure, contact the a librarian for help!

STS Librarian – Maggie Nunley
maggie@virginia.edu  434-924-1343
Schedule an appointment with Maggie online via the STS Subject Guide or at:
http://cal.lib.virginia.edu/appointment/1638

Biomedical Engineering - Nancy Kechner
nek8n@virginia.edu  434-924-0911

Chemical, Mechanical, Materials, and Aerospace Engineering - Jeremy Garritano
jeremyg@virginia.edu  434-982-0054

Civil and Environmental, & Electrical and Computer Engineering - Ricky Patterson
ricky@virginia.edu  434-214-0414

Computer Science – Pete Alonzi
lpa2a@virginia.edu  434-924-7835

Systems Engineering - Kay Buchanan
kaybuchanan@virginia.edu  434-982-2664