Exploring Sources:
Mapping Data Sources on the Web

Data **LITERACY**

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Framework Alignment (see page 8)

Activity Rationale

Few challenges in the world have neatly defined causes and effects. The ability to break down complex topics and questions into related subtopics is a critical first step in beginning any type of research project. Being able to identify stakeholders who produce information on those subtopics and retrieve information for personal use creates the foundation for all research projects.

Activity Description

In this activity, students learn how to analyze a research question by identifying its component subtopics through a concept mapping exercise. They watch a short demonstration of the concept mapping process and apply it to the class topic. In small groups, students identify stakeholders related to one of the subtopics identified. They then locate sample reports or datasets created by stakeholders and record their findings on the concept map, ending with a class discussion of their findings.

Grade Level

High School, College

Objectives

Students will be able to

- divide complex research concepts into subtopics; and
- identify relevant, authoritative, information sources for a research topic or question.

Compelling Question

How can researchers identify and retrieve information relevant to a topic or question?

Time Required

50 minutes

Materials

- Handout 1, one printed copy per student group/pair or one digital copy. Instructor should project or draw concept map on the whiteboard

- Handout 2, one printed copy per group or one digital copy. Use bit.ly or other link shortener for easy access

- Internet access for student groups

- Projector for the instructor

- Whiteboard

- At least one computer (preferably more) per student group. If working individually, each student will need a computer

- Colored felt-tip pens, one per student

- Electronic access to Concept Mapping Instruction video

Preparation

- Watch the Concept Mapping Instruction video and consider how you would map out the topic.

- If the option is available, have students watch the Concept Mapping Instruction video prior to attending class.

Procedure

1. Ask students to sit in groups/pairs. (You can select groups randomly or use groups assigned by the course instructor.)

2. Ensure each group has at least one computer. Explain that students are going to create a concept map.

3. Project the research prompt, "What effect could housing availability have on U.S. state-to-state migration?" Discuss the following:

   - If you were assigned this topic, how would you conduct research about the topic? (*If students are reluctant to answer the question, break it down further with the following questions.*)

   - What would you need to know about state-to-state migration? (*Answers will vary but may include the following:*

- o   *What is it [state-to-state migration]?*

- o   *Who are the people moving between states?*

- o   *What might make people want to move between states?*

- o   *What role (if any) do states play in state-to-state migration?*)

- •   What type of information would help you assess the effects of housing on state-to-state migration? (*Answers will vary but may include the following:*

  - o   *Data on the demographics of people moving*

  - o   *Housing costs in different states*

  - o   *State and local taxes on houses or rentals*

  - o   *New home or multifamily home construction data)*

4.   As students answer the questions, use those answers to start filling out the concept map on the whiteboard, **<u>but do not explain the process yet</u>**. After a few minutes, stop taking answers.

5.   Tell students you're going to walk them through a process for breaking a topic into subtopics to make it easier to research. Refer to the diagram created on the whiteboard. Explain that this process is called concept mapping (or mind mapping), a common brainstorming process.

6.   Explain that concept maps are often described as drawings or diagrams used to help people organize and represent knowledge of a subject. Concept maps begin with a main idea (or concept) and then branch out to show how that main idea can be broken down into specific topics.

7.   Explain that the first step of this process—breaking a topic into its component parts—may involve identifying social, cultural, and economic issues, in this case related to migration and housing. The process will also require thinking of people or organizations who care about those issues, and about the specific data needed to answer the question.

8.   Explain that the goal of this activity is not to answer the research prompt, but rather to learn a universal research process that can be applied to any topic you encounter, whether it's a class project, personal question, or work assignment.

9.   Tell students they will be brainstorming more ideas for the concept map. *<u>Without using computers</u>*, students should talk within their groups and identify subtopics (including social and economic issues, stakeholders, specific data, etc.) they think are components of the original topic; that is, "What effect could housing availability have on U.S. state-to-state migration?"

10.   Distribute a copy of *Handout 1: Concept Map* and felt-tip pens to each group, or make a digital copy available to students.

11. Allow 10 minutes for students to brainstorm within their groups. Tell them to record their ideas on Handout 1 as they will be needed for the second step of the activity.

12. After 10 minutes have passed, spend 5 minutes calling on groups and asking them to share one of their ideas and what "category" of the map they would put it under. Record their ideas on the whiteboard concept map.

13. Tell students that the next step is identifying stakeholders—people, government offices, non-profits, and other groups that are invested in the topics they just identified. As students identify stakeholders, they can visit their websites and retrieve published data (white papers, datasets, interactive maps, etc.) to use in their own research.

14. Assign each group one of the subtopics from the concept map and tell them that their next task is to use their computers to locate three to five stakeholders relevant to their subtopic. (Use three sources for pairs, five for larger groups.)

15. Distribute a copy of *Handout 2: Data Sources* to each student, or make a digital copy available to students. Explain that the handout lists select government and non-profit data sources. Explain that they may include stakeholders from that list, but that they also must locate at least one source not included on Handout 2. Tell them they must record one example of a dataset or report from each stakeholder, including the publication's name and URL on the group's concept map.

16. Allow about 10 minutes for students to work on internet searches to locate potential sources. During this period, actively circulate around the room, checking group progress and answering questions.

17. Randomly select groups to report their findings. Have them state which subtopic they worked on and tell the class about one of the stakeholders they found and why it is a useful source.

18. Review the key components of this activity by discussing the following:

    - What is a concept map? (*A concept map is often described as a drawing or diagram used to help people organize and represent knowledge of a subject.*)

    - Why is a concept map a useful tool for research? (*Concept maps take a main idea [or concept] and branch it out to show how that main idea can be broken down into specific topics to make the research process more manageable and effective.*)

    - What is the first step to take when approaching a new research question? (*Break it into its component parts*)

    - What factors might be considered in doing this? (*Social, cultural, demographic*)

    - What is the second step? (*Identify stakeholders*)

    - Who might stakeholders be? (*People, government offices, or non-profit groups*)

19. Remind students that this process works for any type of research. It is just as useful in doing research to choose a city to move to as it is for other classroom assignments they may be given.

Assessment

20. At the end of class, collect the concept maps or take pictures of them. Depending on the time available, provide feedback verbally in class or in writing after class.

    Feedback should address the following:
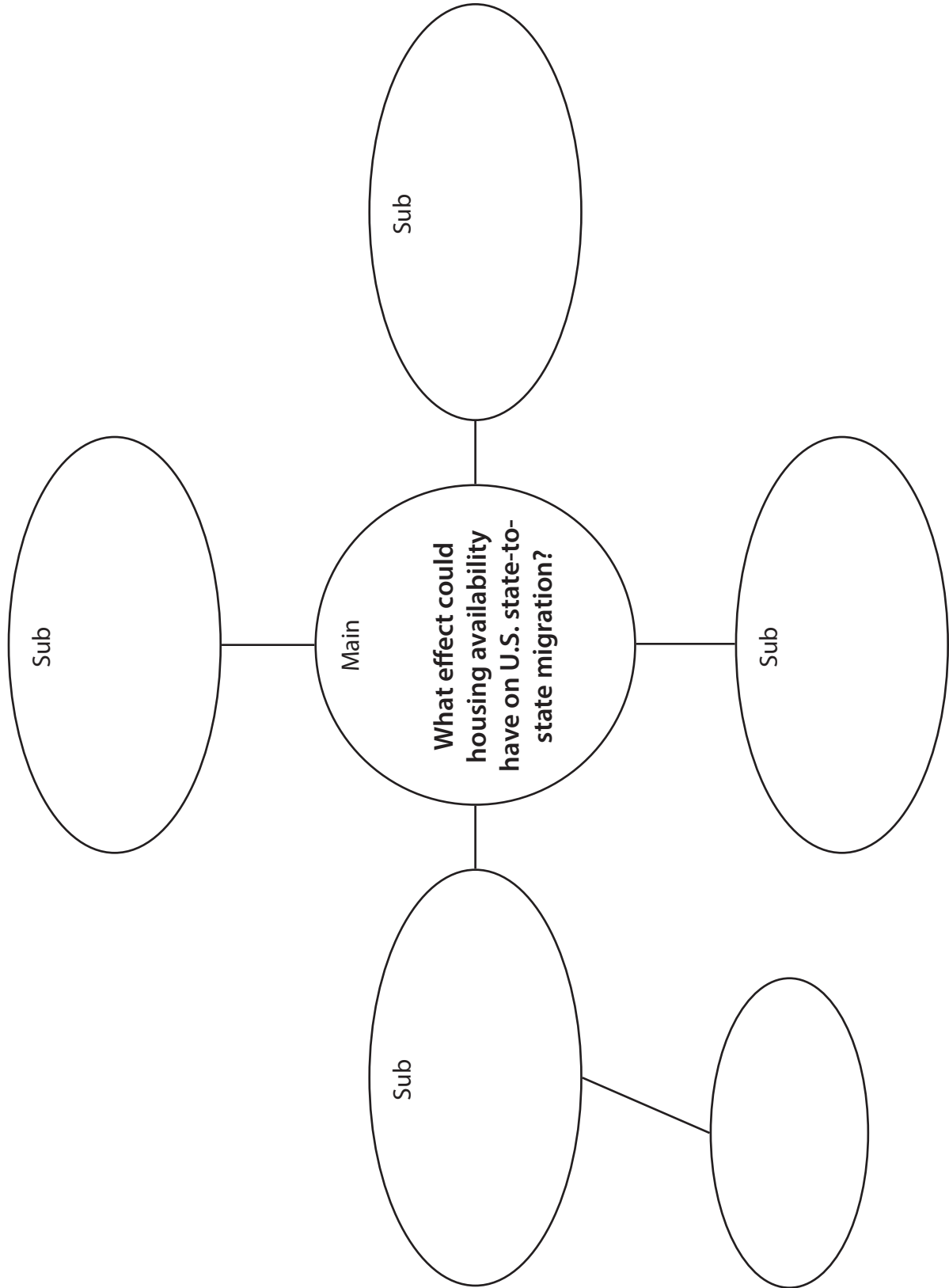
    - Effective application of concept mapping process (Steps 6-7)

    - Thoroughness of identification of subtopics (Step 9)

    - Accurate identification of stakeholders and dataset/report (Step 14)

    Additional Notes: If class time allows, or the instructor is able to assign post-class homework, an alternative assessment method could be to ask students to independently complete a concept map on a different research question.

    Example questions include the following:

    - "How does public transportation impact traffic congestion?"

    - "How does remote work impact labor productivity?"

Handout 1: Concept Map

Main

What effect could housing availability have on U.S. state-to-state migration?

Sub

Sub

Sub

Sub

Handout 2: Data Sources

Data and Statistics About the U.S.

Government agencies at the federal, state, and local levels publish statistical information on a wide range of topics. You may need to do further research on their websites to determine which agency has the information you are looking for and what data formats are available.

Remember, keywords are important when doing a search. Make sure your keywords can help narrow down the search results. For example, instead of trying a search for "housing statistics," try something more specific like "housing prices," "vacancies," or "housing construction."

National Data and Statistics

The following organizations collect, analyze, and disseminate statistical data and information:

- FRED® (Federal Reserve Economic Data) aggregates economic time series data on labor markets, national accounts, population, and business activity from many sources.

- Bureau of Economic Analysis collects information on economic indicators, consumer spending, accounts, and industry.

- Bureau of Labor Statistics measures labor market activity, working conditions, and price changes in the U.S. economy.

- Bureau of Transportation Statistics provides data on airline on-time performance, pirates at sea, transportation safety and availability, motorcycle trends, and more.

- Census Bureau Data is the main source of data about our nation's people and economy, including employment, housing, internal migration, and more.

- HUD Datasets provides access to datasets including the American Housing Survey, median family incomes and income limits, and more.

You can also search an agency's website to see what types of statistical information it provides. Find the U.S. government department or agency you want to search.

Mapping Tools

- FRED® maps offers researchers the ability to create and share geographical maps of data found in FRED®.

- The National Map offers mapping products from federal, state, and local partners on a variety of topics, such as recreation, environmental resources, scientific analysis, and emergency response.

- U.S. Census Interactive Maps provides a variety of mapping tools, including the Census Flows Mapper, OnTheMap, and SAHIE Interactive Data Tool.

Framework Alignment

ACRL Framework: Searching as Strategic Exploration

Searching as strategic exploration refers to the understanding that information searching is often nonlinear and iterative, requiring the evaluation of a broad range of information sources and the mental flexibility to pursue alternate avenues as new understanding is developed.

Knowledge Practices

- Identify interested parties, such as scholars, organizations, governments, and industries, who might produce information about a topic and then determine how to access that information.

- Utilize divergent (e.g., brainstorming) and convergent (e.g., selecting the best source) thinking when searching.