

2.1 Worksheet - Developing a Thesis / Starting ISU Project

MDM4U

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Your first task is to identify a topic for your project. Your topic needs to be of interest to you personally. It must also involve sufficient mathematical content and analysis to constitute a reasonable culminating project.

Some possible sources for ideas include:

- A sport or hobby that you enjoy
- A social issue of interest to you
- An interesting issue from the Internet or other media
- An issue arising from employment or a possible future career

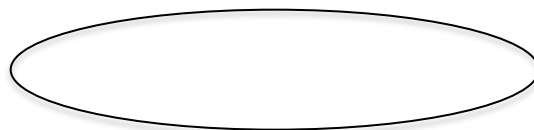
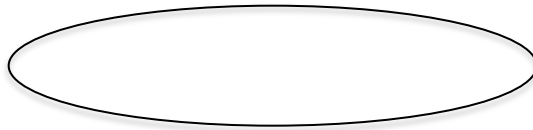
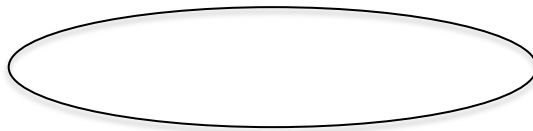
When determining your topic, it is important to note the difference between a subject and a topic. The word **subject** denotes a broad category, a general area of interest that you may wish to explore further. The word **topic** denotes a specific aspect of the subject that requires detailed research. Complete the chart below before choosing your topic. Add one topic to each subject and create your own example.

Subject	Topic
Television	Ratings wars Digital cable versus satellite
Medicine	Hospital closures and staff cutbacks Doctor/nurse shortages Health-care funding levels
Post-secondary education	Tuition fees Entry requirements Degree requirements
Travel	Air safety Vacation destinations Cost
Music	Musical styles Music and sports Comparing musicians

A useful tool for generating and organizing related topics is called a mind map. A mind map begins with a broad, general subject and generates topics and sub-topics related to the main subject.

Mind maps typically have several levels. Each level flows from the level above it. The magnitude of the topics at each level is smaller than the previous level.

Select three of the following subjects: automobiles, music, movies, sports, dance, fashion, travel, occupations, crime. Then, brainstorm topics and sub-topics and construct a mind map for each of your three topics. Try to include several levels in your mind maps.



Once you have narrowed down your topic, you will have to create a well-written thesis question or statement that clarifies exactly what your project is designed to do. Your project must aim to answer a specific problem. The problem should satisfy all of the following:

- Significant problem of interest to YOU
- Involve the collection of a large amount of data
- Involve the organization of a large amount of data
- Involve the analysis of a large amount of data
- Allow the use of technology

When developing your thesis question, use the following series of questions to determine if your thesis question is effective:

- 1) Does the thesis question clearly identify the main objective of my presentation?
- 2) Does my thesis question clearly identify the main variables that will be studied?
- 3) Does my thesis question use specific language that tells audience what I am going to do, rather than vague language?
- 4) Is my thesis question interesting? Does it make me want to research further?
- 5) Is my thesis question too general or too specific?
- 6) Does my thesis question show evidence of original thought? Is the topic I am proposing worth writing about?

Example: Suppose you plan to investigate the effect of increased tuition fees on university accessibility. Two possible thesis statements/questions you could use to investigate this topic are:

- 1) Increases in tuition fees over the last ten years have forced large numbers of middle class students to give up on a university education.
- 2) Increases in tuition fees over the last ten years have allowed universities to broaden the range of specialty programs offered.

Notice that in the examples you are not initially stating that your hypothesis is true. You are taking a position, which you will test by collecting and analyzing data.

Example: Gord loves to watch TV and would like to study the TV-watching habits of his classmates. Create three thesis questions related to this topic that can be statistically studied.

1)

2)

3)

Example: Determine the main variables in the following thesis questions

a) Are females better than males at estimating the size of large crowds?

The main variables are: gender, estimates of size of crowds, actual size of crowds

b) Is there a relationship between the quality of a person's clothing and her or his mid-term average?

The main variables are:

Example: For each pair of variables, create a thesis statement/question that could be tested.

1) Car insurance and driver age

Thesis: Insurance premiums for young drivers are higher because they are at greater risk of causing an accident.

2) Sports team profits and player salaries

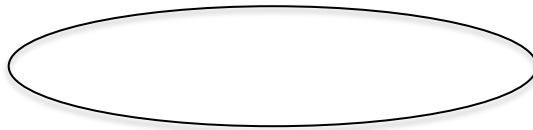
Thesis:

3) Income and level of education

Thesis:

Your Project

Task 1: Design a mind-map of your interests with at least three levels.



Task 2: Select a topic

The topic you are going to base your project on is: _____

Task 3: Create a thesis question

Develop three possible thesis questions/statements related to your topic of interest

1)

2)

3)

Task 4: Conduct preliminary data search on your topic. The type and quantity of data available may require you to change your topic or thesis question.