

Research Essentials

Workbook

Unit 1: Basic Research & Research Questions

TOWES - Test of Workplace Essential Skills

TOWES

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Unit 4 – Page 7 Cartoon Shaun McCallig ID smgn64

TOWES Research Essentials

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How to use this eWorkbook:

This workbook is meant to guide learners in a step by step method to attaining the stated learning outcome listed on the first page. Print this workbook out and write notes in the margins. Fill in the learning activities using a pencil to allow for mistakes and brainstorming during your learning process.

You may choose to complete this workbook on your own, but it may be helpful to locate a mentor or trusted friend or advisor to give you feedback on your completed learning activities.

Make sure to explain or summarize the main concept of the unit and the purpose of each learning activity to your mentor before you ask for feedback. The purpose of this collaboration is NOT for your mentor to tell you that something is right or wrong, but rather just to give you some constructive and objective feedback that may allow you to look at things in a new way or from a different perspective. Chances are that if you can clearly explain the concepts of the unit and your mentor understands what you have completed in your learning activities - you are on the right track.

Essentially, you have the final say on how you complete your learning activities, and how you use the templates provided in this course, but generally a good rule of thumb is that two heads are always better than one! If you are having difficulties working on your own, ask someone for help or feedback.



Step 1: Read the entire workbook.



Step 2: Complete the learning activities.



Step 3: Ask for feedback on learning activities from a mentor or trusted advisor.



Step 4: Use the templates for school, home, or work situations.



The Story: David's Pasta Problem

Welcome to Unit 1 of the Research Essentials Learning Series. Meet David. This is his story about how using some fundamental and basic research concepts helped David to ask the right questions, collect information and come to a well-formed conclusion.

David is a chef at a small café that specializes in gluten free menu options. Usually the cafe on the weekends has a line up out the door and it's become a popular place in the neighborhood. Food quality and taste are extremely important to David and he takes his menu planning very seriously. He wants to research the various types of gluten free pastas that are available on the market today. David wants to offer his customers the best tasting pasta available and hopes that they would not be able to taste the difference between the regular pasta dishes and the gluten free options.

David has been asked to share his findings with a local food magazine in the form of a short article that outlines his research. He feels this is important exposure for the restaurant and can also help the gluten free community to cook more healthy and satisfying meals for themselves.

David wonders how he should get started in conducting his research. He is a bit confused as to what to do first. He is taking this research very seriously and wants to approach it in a systematic way that will give him the best data and information to make a good decision for his customers and his restaurant.

Unit 1: Basic Research & Research Questions

Q: *Why is it important for me to learn this material?*

In the information age it is important to know how to research various topics by exploring focused research question(s) and utilizing a systematic approach that helps you to arrive at a conclusion that is based on facts and reliable sources.

Q: *How long will it take me to complete this workbook?*

It should take learners about 2 hours to complete this unit.

Learning Outcome

When you complete this unit you will be able to...

Apply basic approaches to writing a focused research question and brainstorming the logistics of a future research topic.

Learning Objectives

Unit 1 focuses on the following Objectives:

1. Describe what research is, what it means, reasons why someone might conduct research and what the basic research process is.
2. Characterize the procedure and components of choosing a focused research question that is not too broad or too narrow.
3. Utilize graphic organizers to help focus a research topic or question

Learning Activities

Please complete the following learning activities:

- Learning Activity 1: Research Terms Matching Game
- Learning Activity 2: Broad, Narrow or Just Right?
- Learning Activity 3: Writing a Research Question using Graphic Organizers



OBJECTIVE ONE

When you complete this objective you will be able to...

Describe what research is, what it means, reasons why someone might conduct research and what the basic research process is.

Learning Material

As introduced in this unit's case study, David wanted to understand the various components of formal and informal research in order to get a basic understanding of what research is, and how he can do a small research project effectively and systematically. He knows that research can be a very complex subject, but he feels that if he could understand the foundational components he would have a good starting point to conduct his own informal research and investigate questions and problems in an effective and factually driven way.

As human beings, we are constantly trying to understand our world. We undertake a number of *formal* or *informal* investigations to make sense of our reality. These investigations not only improve our understanding of the world around us, but also help us to form the basis of future investigations when exploring different areas of interest.

What is Research?

Most people seem to believe that research is simply reading a book or typing a 'keyword' into a popular online search engine on your computer. However, looking up the official definition in the Oxford English Dictionary the term 'research' can be described as:

"A systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions" (Oxford English Dictionary)

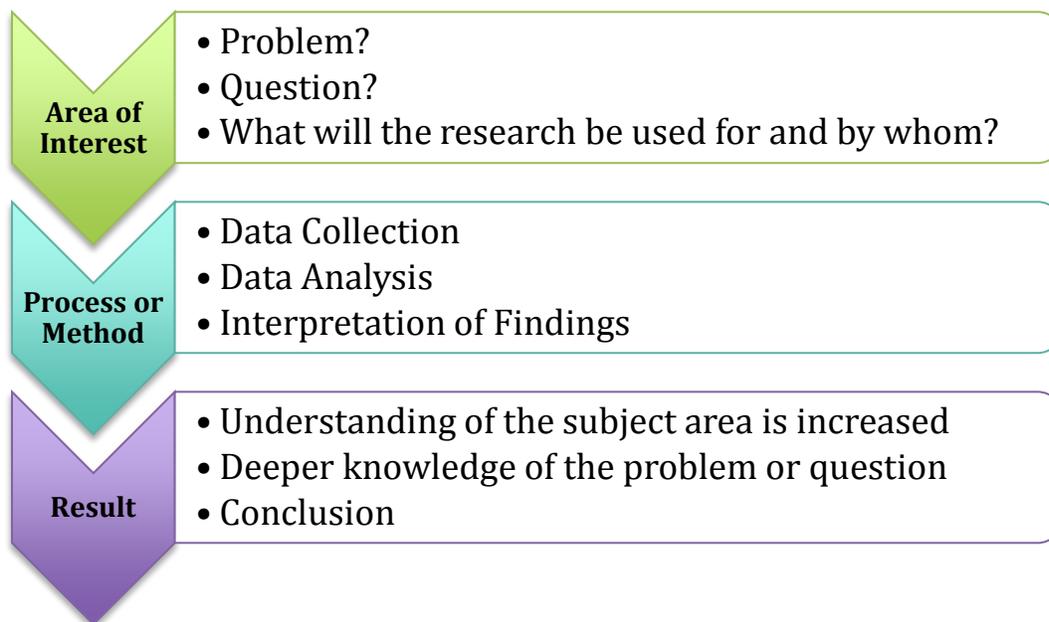
This definition has a few terms that we must unpack:

- **Investigation:** This is a careful search or examination in order to discover facts.
- **Systematic:** This means following a fixed plan, done in an effective, methodical way.
- **Materials/sources:** This information does not simply appear out of thin air, it is collected from books, articles, videos and documentaries.
- **Fact:** A statement that can be proven, verified, or demonstrated.
- **Conclusions:** The aim of all new research is to reach a conclusion on a given topic or hypothesis. The research either proves or disproves the initial thesis.

We all have our own concept of what research is and what it means because of our past experiences. For example, have you ever been asked to complete a questionnaire, answer a telephone survey, or to be a part of a focus group discussion? If so, you likely have been involved in a research study. In other instances you may have read the results of a political poll or medical drug trials, which are based on results from a research project. From a personal standpoint maybe you had to research the best type of vehicle or product that will best suit your needs and budget? That is research too. A person may have to conduct various research activities on a formal or informal basis for school, work, or for personal interest.

When conducting research, we gather information to address issues, solve problems and add to our knowledge. Research requires a set of skills and a clear understanding of the process that you will need to take in order to arrive at an accurate conclusion.

As indicated in the chart below all research starts with an area of interest that is posed as a problem or question. It is also important to ask yourself ‘what’ the research will be used for. Who will use this information and why? After an *area of interest* has been identified, the researcher investigates, collects data, analyses it, and interprets it. From this research process the researcher gains a deeper knowledge and understanding of the subject. Usually the research is documented and communicated as a written document or PowerPoint presentation.



The research results may be communicated as any of the following:

- **Expository Essay:** Explains
- **Persuasive Essay:** Persuades
- **Literary Analysis:** Analyzes
- **Article:** Describes
- **PowerPoint:** Shows

Q: Why conduct research?

Research is a way that we can:

- ✓ Investigate issues of concern or interest,
- ✓ Look for trends,
- ✓ Show interest in particular issues,
- ✓ Provide real life examples,
- ✓ Work from different perspectives,
- ✓ Make decisions based on the data we have collected

Q: Why is it important to conduct research rather than rely solely on our own personal knowledge and experience?²

Relying on personal knowledge can lead to:

- **Overgeneralization:** Statements that exaggerate and oversimplify reality, ignoring important details.
- **Selective Observation:** Choosing to look only at things that are in line with your own personal preferences/beliefs.
- **Illogical Reasoning:** Jumping to conclusions based on incomplete or incorrect information.
- **False Consensus:** The tendency of people to overestimate the level to which other people share their beliefs, attitudes, and behaviors.

There are different types of research including *formal* or *informal*. Over the past two decades, electronic sources of information have been increasing and are more widely available. The advancements in technology are making formal and informal information gathering methods easier through the availability of electronic resources, therefore making informal research much easier.

1. Adapted from: Neuman, W.L. 2011. *Social Research Methods: Seventh Edition*. Boston, Allyn & Bacon.
2. Adapted from: David Porush, *A Short Guide to Writing About Science*. (New York: Harper Collins, 1995), 92-93

Formal Research: is very controlled type of investigation, it must be objective, and have a systematic process of gathering of data. The researcher carefully defines the things under investigation and outlines specifically what will and won't be studied. Formal Research has very prescribed rules that are carefully followed when gathering and assessing the data. It is also important to note that all *formal research* will either take a Quantitative or Qualitative Approach.

- If your research aims to find out the answer to a problem or question with *numerical* evidence, then you would take a **Quantitative Approach**.
- If your research aims to explain *why* a particular event or phenomenon happened, or provides underlying observations, reasons, opinions and insights into a problem or question then you would take a **Qualitative Approach**.

A list of various Types of **Formal Research** strategies:

Applied Research	Would try to address everyday issues and concerns.
Exploratory Research	Would aim at discovering whether there is an issue in the first place.
Descriptive Research	Would describe an issue in detail.
Explanatory Research	Would provide an explanation and identify cause and effect.
Generalizable Research	Would facilitate the use of results from one setting and generalize them to another.
Predictive Research	Would make predictions based on noticeable trends or cause-effect factors.
Action Research	Would be intended with a practical outcome in mind.

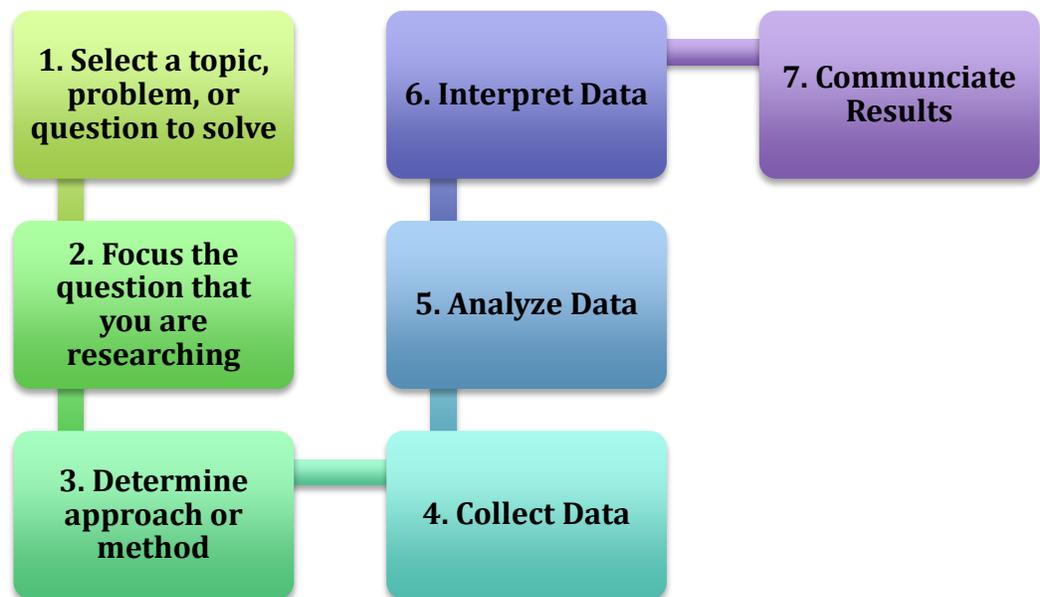
Not all research has to be scientific. For personal research most of us will use an informal approach. But having knowledge of formal research approaches can help us to structure our thinking improving the way we conduct research and investigate problems and decision-making in a systematic way.

Informal Research can be defined as a less structured way to investigating a question or problem. It is more subjective to the researchers preferences, and personal experience. We will discuss research methodologies in upcoming units.



Professor E says... Whether you take a formal or informal approach to research, remember research is the systematic investigation of a topic of interest, through a process of data collection, analysis and interpretation, to arrive at a greater understanding of that topic.

The basic process for ALL types of research:



Please note that in this unit we will only explore steps 1 and 2:

1. Selecting a Topic
2. Focusing the Question

Chart adapted from: Neuman, W.L. 2011. Social Research Methods: Seventh Edition. Boston, Allyn & Bacon.

Learning Activity 1: Matching Game

Complete the Learning Activity listed below...



Without looking at the previous pages, match the terms below with the correct definitions by drawing a line connecting the word to the proper definition.

Terms:	Definition:
a) Research	1) If your research aims to find out the answer to a problem or question with numerical evidence
b) Qualitative	2) A systematic and structured investigation into a study of materials and sources in order to establish facts and reach new conclusions.
c) Quantitative	3) If your research aims to explain why a particular event or phenomenon happened, or provides underlying observations, reasons, opinions and insights into a problem or question
d) Informal Research	4) Taking an isolated event and broadly generalizing to all other events with no proof or logical rational.
e) Conclusion	5) It can be defined as a less structured way to investigate a question or problem. It is more subjective to the researchers preferences, and personal experiences.
f) Overgeneralization	6) A final decision where an opinion or decision is formed after a period of thought or research.

Please Note: Check your answers using the 'Answer Key' located at the end of the workbook

OBJECTIVE TWO

When you complete this objective you will be able to...

Characterize the procedure and components of choosing a focused research question that is not too broad or too narrow.

Learning Material

A Focused Research Topic

Choosing a focused research topic is an important skill. When deciding on a topic, there are a few things that you will need to do. Use the checklist below to help you choose a research topic.

Writing a Research Topic Checklist:

	Brainstorm for ideas by looking up information on your chosen topic
	Make sure to choose a topic that is interesting and relevant to you
	Ensure that the topic that you choose is manageable and that enough resource material exists and is available
	Make a list of key words related to topic
	Be flexible with your topic, adjust if needed
	Read lots of information about your topic before formulating your research question / thesis statement
	Write your topic as a focused research question?

Please note that sources for collecting data may include: online articles, e-reviews or opinion polls, digital newspaper publications, e-mail discussions, bulletin boards, blogs, digital books, and scholarly Web sites.

Types of Research Questions:

Factual Questions simply look for causal relationships and describe them. (E.g. What type of solution(s) are required to remove permanent felt marker off plastic, glass or metal surfaces?)

Comparative Questions identify two alternatives to a situation and compares the alternatives in actual practice. (E.g. Does bio diesel produce less greenhouse gas than regular diesel fuel?)

Predictive Questions construct "scenarios" of how things might be in the future (E.g. Will a lower pH of seawater increase the rate of ice melting?)

Problem-Solving Questions propose solutions to existing problems (E.g. Does the use of a cover reduce evaporation from hot tubs or pools?)

Paradoxical Questions explore an apparently contradictory situation to make a suggestion for resolving the contradiction (E.g. How can we fertilize crops without polluting ground water?)³

Important Questions to Ask

As noted in the from the Vanderbilt University Writing Center these are important questions to ask yourself about your research topic:

- Is the research question something I/others care about? Is it arguable?
- Why am I conducting the research?
- Does it solve a problem and for whom?
- Is the question too broad or too narrow?
- Is the research question researchable for given time frame and location?
- What information is needed to do your research including:
 - Personal knowledge?
 - Internet Resources?
 - Primary Sources?
 - Secondary Sources?
 - Statistics?
 - Scientific Data?
 - Historical Data?

³ Chin, C., and Osborne, J., (2008) Students' questions: a potential resource for teaching and learning science. *Studies in Science Education* 44:1-39.

Please note that we will get more in-depth about information sources in future units. In this unit we are focusing more about how to identify focused research topics remember that...

Focused research questions should accomplish one of these goals:

- 1) Define or measure a specific fact or facts about a specific phenomenon
- 2) Provides underlying observations, reasons, opinions and insights into a problem or question.
- 3) Match facts and theory.
- 4) Evaluate and compare two theories, models, or hypotheses.
- 5) Prove that a certain method is more effective than other methods¹



Professor E says... Be aware that selecting a good topic may not be easy. A good research question (or thesis statement) must be narrow and focused enough to be interesting, yet broad enough to find enough information. Before selecting your topic, make sure you know what you want your final project to look like. Are you planning on writing a paper, creating a PowerPoint presentation, or creating charts or graphics that summarize your research results for a specific use or purpose?

Broad, Narrow or Just Right?

A research topic can be too broad or narrow which will make it difficult for you to single out specific information or be overwhelmed with too much information.

You will know that your topic is too *broad* when:

- The topic cannot be covered with any specific detail.
- All you can write are general statements about a general subject.
- It is hard to research because there is so much information. For example, if during your initial investigation, you found 1000s of items relevant to your topic, it is too broad.

A research topic can be to *narrow* if:

- The topic can be discussed in great detail in less than the required size of your research project.
- The topic is hard to research because there is so little information or data. For example, if, during your overview research, you found only 3 or 4 items relevant to your topic, it is too narrow.

A research topic is ***just right*** when:

	You can find enough information to examine the subject in detail
	You can create an interesting and informative project that meet the requirements of your assignment
	Ensure that the topic that you choose is manageable and that enough resource material exists and is available

Characteristics of a good research question:

- a) The question focuses on only 2 or 3 variables.
- b) The question is defined with respect to current knowledge.
- c) The question can be investigated within available time and resources
- d) The question uses comparative terms /adjectives (e.g. faster, higher, improved on...).
- e) The question uses clear concepts.
- f) The question includes a cause and effect relationships

Learning Activity 2: Too broad, too Narrow or just Right?



Complete the Learning Activity listed below...

Looking at the various research questions below please identify if the research questions are too broad or too narrow and what can be improved upon to make it a good research question. While a good research question allows the writer to take an arguable position, it DOES NOT leave room for ambiguity so be clear about the - who, what, when, where and why as you can. Refer to the *Characteristics of a Good Research Question* listed on the previous page.

1. Why is sugar harmful?
2. What are the best brands of Pasta?
3. Do violent television shows increase crime?
4. Does the amount of water a person drinks daily contribute to good health and less illness?
5. Are generic brand laundry soaps the same quality and effectiveness as the more expensive name brand laundry soaps?

OBJECTIVE THREE

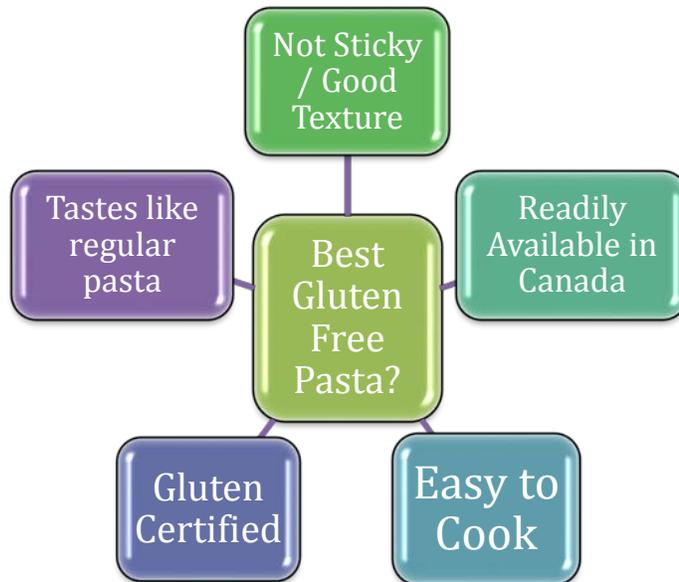
When you complete this objective you will be able to...

Utilize graphic organizers to help focus a research topic or question

Learning Material

Using Graphic Organizers to Focus a Topic

Graphic organizers are another good way to help think of key words and brainstorm or focus a research topic. Let's look back to David who is mentioned in the case study at the start of this unit. David wants to research the best gluten free pasta brands on the market but he isn't 100% sure if he should be more specific or detailed in his topic statement. David decided to create a graphic organizer as seen below to help him.



After David created his first graphic organizer he realized that it was helpful to think about his topic question. By identifying key words David could think more deeply about his problem, what he was actually trying to solve and whether or not there was actually a problem there to investigate.

David took another look at the characteristics of a good research question:

- Focuses on only 2 or 3 variables.
- Is defined with respect to current knowledge.
- Can be investigated within available time and resources
- Uses comparative terms /adjectives (e.g. faster, higher, improved on...).
- Must use clear concepts.
- Includes a cause and effect relationships

He realized that various things were missing from his research topic in order to make it a good research question. From his above graphic organizer he could see he was missing these from the list above:

- ✓ Uses comparative terms or adjectives (e.g. faster, higher, improved on...).
- ✓ Includes a cause and effect relationships

He decided to make another graphic organizer to help identify comparative terms and a “cause and effect” relationship to help focus his topic question:



David realized that his topic question not only needed to address the best brand of gluten free pastas available in Canada, but also the ideal cooking methods and amount of salt used in the cooking water. From using the checklists and questions shown in this unit he was able to come up with his focused research question.

After being reminded about *Cause and Effect Relationships* he thought more about the type of water that the pasta was cooked in and how it impacts the taste and consistency of the pasta.

This is the research question David came up with:

“How does various cooking methods, temperatures, and water/salt saturations impact taste, texture and consistency of popular Canadian brands of Gluten Free Pasta?”

Learning Activity 3: Write your Own Research Question



Please Note:

Keep in mind this activity can be quite challenging – good research questions can take 30-60 minutes or longer to write!

Complete the Learning Activity listed below...

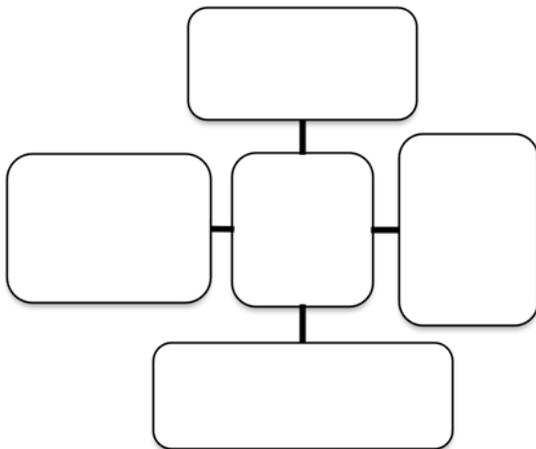
1. Identify Topic Ideas

Make a list of 5 possible topics and issues you might like to investigate. Consider how and why you arrived at this list. Note any personal links with any of the topics and issues and consider how these may affect you.

- a)
- b)
- c)
- d)
- e)

2. Use Graphic Organizers

On a blank sheet of paper draw one or two Graphic Organizers to help you brainstorm and then write *one* focused *research question*. Include your topic idea in the middle circle and then connect related concepts or ideas that are relevant to your topic and direction of research interest. Start with simple topics in your first, graphic organizer, then on the second graphic organizer ensure there is a cause and effect relationship noted in at least one of the boxes.



Remember to refer to the following characteristics of a good research question:

- a) Focuses on only 2 or 3 variables.
- b) Is defined with respect to current knowledge.
- c) Can be investigated within available time and resources
- d) Uses comparative terms /adjectives (e.g. faster, higher, improved on...).
- e) Must use clear concepts.
- f) Includes a cause and effect relationships

Unit 1: Building Vocabulary



Directions:

- Read the list of the terms below
- Use either Google, or an online dictionary, to define each word.
- On a piece of paper, write down the meaning of the word in English
- If English is NOT your first language translate it into your native language using an online translator tool such as <https://www.babelfish.com/>
- Do this for each word listed below

1. Investigation
2. Research
3. Formal
4. Informal
5. Overgeneralization
6. Illogical
7. Quantitative
8. Qualitative
9. Methodology
10. Brainstorm
11. Comparison
12. Problem
13. Adjective
14. Variables
15. Affect
16. Effect



Learning Activity 1 Answers:

Without looking at the previous pages, match the terms below with the correct definitions by drawing a line connecting the word to the proper definition.

Terms:	Definition:
a) Research 2 b) Qualitative 3 c) Quantitative 1 d) Informal Research 5 e) Conclusion 6 f) Overgeneralization 4	1) If your research aims to find out the answer to a problem or question with numerical evidence 2) A systematic and structured investigation into a study of materials and sources in order to establish facts and reach new conclusions. 3) If your research aims to explain why a particular event or phenomenon happened, or provides underlying observations, reasons, opinions and insights into a problem or question 4) Taking an isolated event and broadly generalizing to all other events with no proof or logical rational. 5) It can be defined as a less structured way to investigate a question or problem. It is more subjective to the researchers preferences, and personal experiences. 6) A final decision where an opinion or decision is formed after a period of thought or research.



Learning Activity 2 Answers:

Looking at the various research questions below please identify if the research questions are too broad or too narrow and what can be improved upon to make it a good research question. While a good research question allows the writer to take an arguable position, it DOES NOT leave room for ambiguity so be clear about the - who, what, when, where and why as you can. Refer to the *Characteristics of a Good Research Question* listed on the previous page.

1. Why is sugar harmful?

This question is unclear because it does not specify what type of sugar (fructose vs. sucrose), who would be harmed by it, and what type of harm. Moreover, this question implies that “harm” already exists. A clearer question would be the following:

Do children who eat lots of processed sugar (sucrose) experience a higher incidence of cold and flu in the winter season?

2. What are the best brands of Pasta?

This question is a bit too broad. What is the question or problem being solved? Who is the audience and what is the cause and effect relationship here?

3. Do violent television shows increase crime?

This question identifies a specific cause and effect relationship that can be investigated.

4. Does the amount of water a person drinks daily contribute to good health and less illness?

This question is also a good example of a direct cause and effect relationship between water and its correlation to good health.

5. Are generic brand laundry soaps the same quality and effectiveness as the more expensive name brand laundry soaps?

This question would be an easy question to investigate and conduct first hand research. This is a great question with specific cause and effect and is within a manageable scope.

References

- David Porush, *A Short Guide to Writing About Science*. (New York: Harper Collins, 1995), 92-93
- Chin, C., and Osborne, J., (2008) Students' questions: a potential resource for teaching and learning science. *Studies in Science Education* 44:1-39.
- Filippo Silestri's Wiki: [http://deseng.ryerson.ca/xiki/Research/Main:Conducting research](http://deseng.ryerson.ca/xiki/Research/Main:Conducting_research)
- Neuman, W.L. 2011. *Social Research Methods: Seventh Edition*. Boston, Allyn & Bacon.
- Stacks, W. Don. 2010. *Primer of Public Relations Research*. Guilford Press (p. 18)

Research Questions:

- https://www.sagepub.com/sites/default/files/upm-binaries/48453_ch_1.pdf
- http://twp.duke.edu/uploads/media_items/research-questions.original.pdf

How to select a Research Topic:

- <http://www.praccreditation.org/resources/documents/APRSG-Research.pdf>
- <https://www.umflint.edu/library/how-select-research-topic>
- http://www.21stcenturyschoolteacher.com/uploads/8/5/4/4/854417/mappingforsuccessessaywriting_copy_copy.pdf

Focused questions:

- http://info-skills.lib.vt.edu/choosing_focusing/10.html

Open Educational Resource

TOWES – The Test of Workplace Essential Skills is Canada’s premier literacy and essential skills assessment. Over 120,000 people have used TOWES on their pathways to success in education, employment and life.

TOWES' suite of assessment products have been used by various learning institutions and employers, with over 100,000 TOWES assessments completed by individuals across Canada.

