Searching Effectively & Efficiently

Techniques you can use to enhance your literature searching skills

DATE: October 18, 2023
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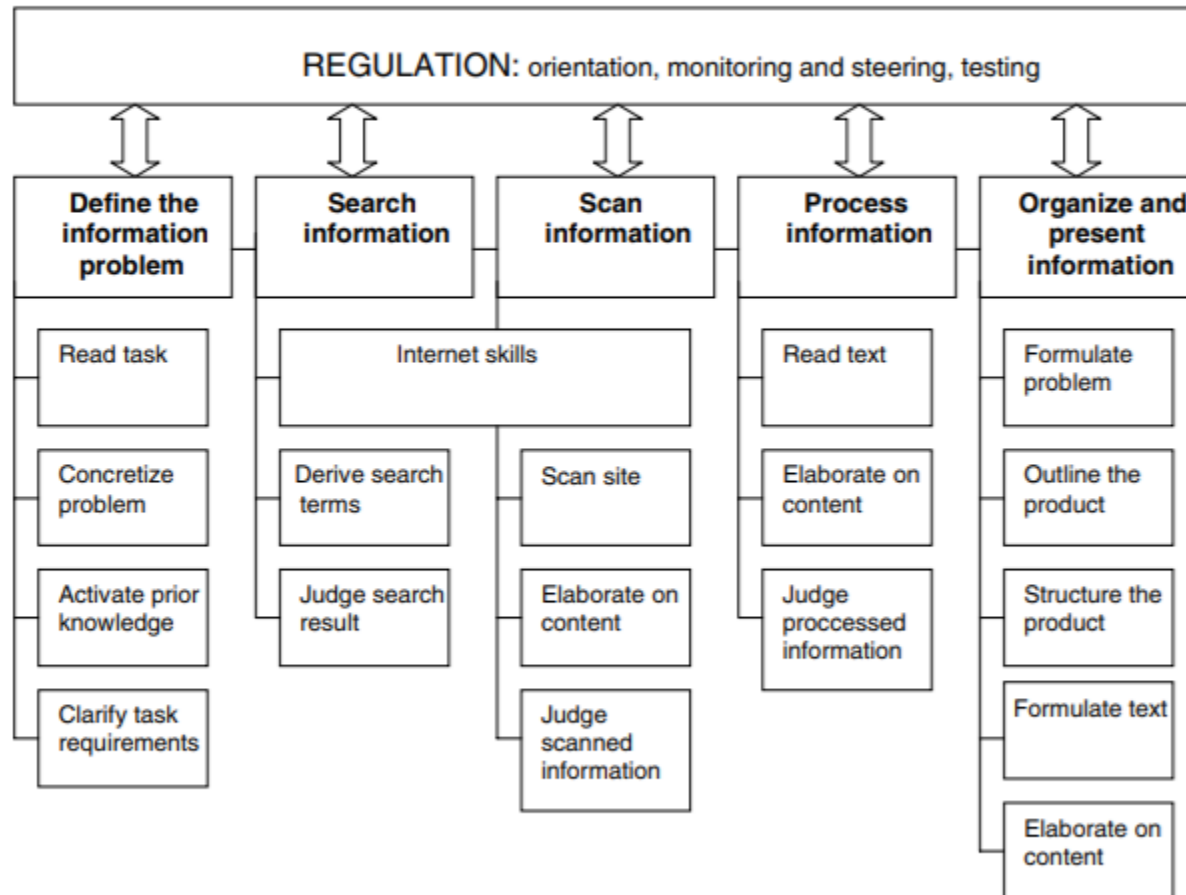# Many skills are required to conduct an effective literature search

Fig. 2. Skill decomposition of the information problem-solving skill.

Many skills are required to conduct an effective literature search
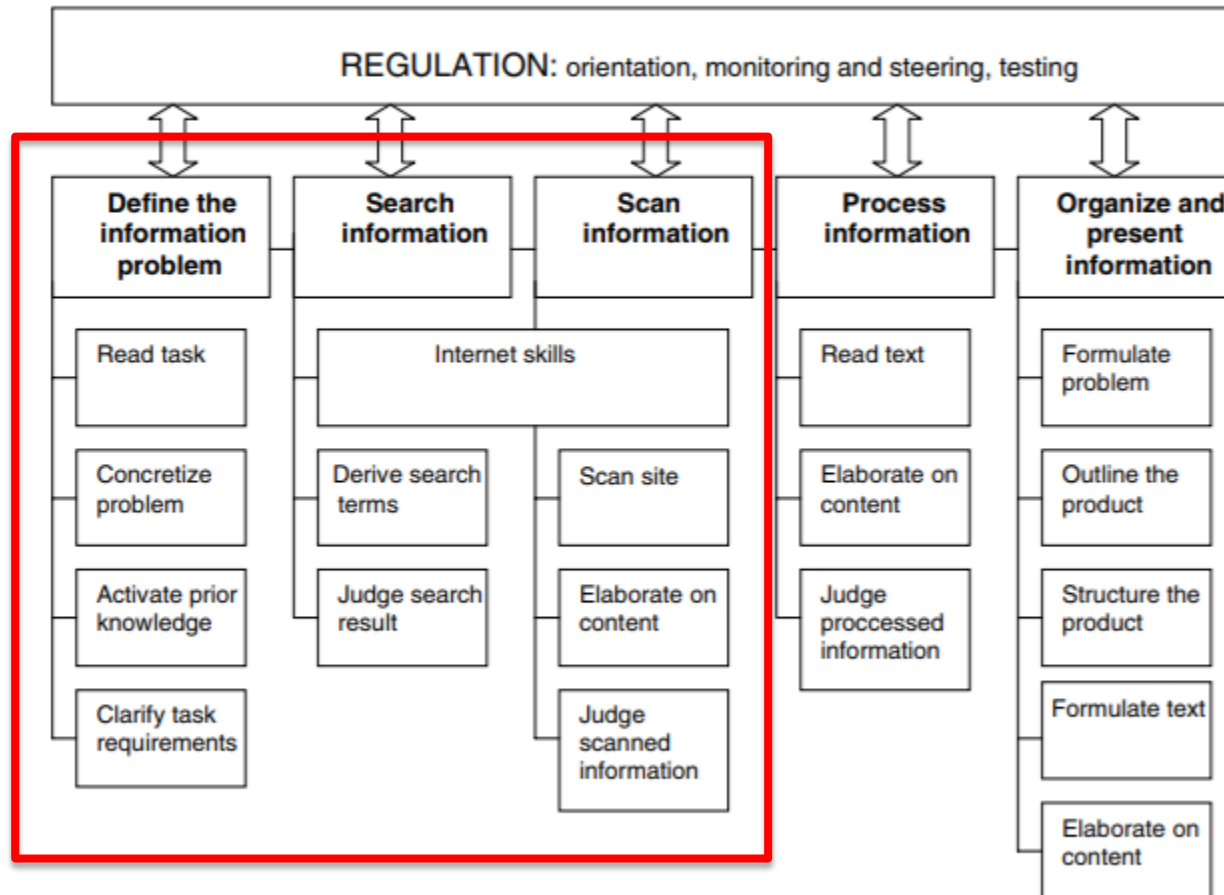
Fig. 2. Skill decomposition of the information problem-solving skill.

The Evidence Cycle

ASSESS
clinical or policy problems and identify key issues

APPLY
evidence to clinical or policy problems

APPRAISE
the validity, importance, and applicability of evidence that has been retrieved

ASK
well-built questions that can be answered using evidence-based resources

ACQUIRE
evidence using selected, pre-appraised resources

4
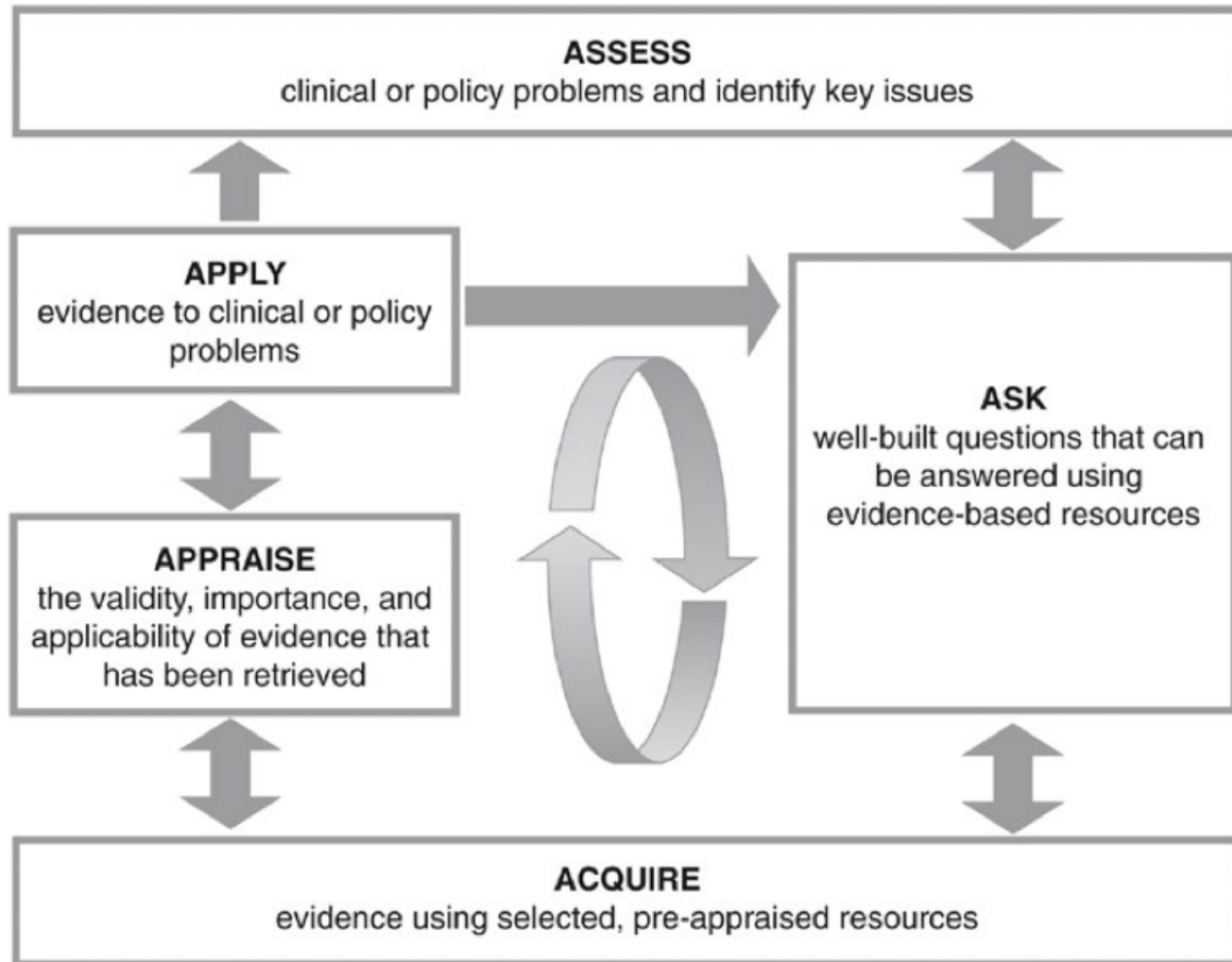
Types of Questions: Background vs Foreground

Background:
- Deals with the general knowledge or basic understanding of a concept
- Information available in Books and Review articles

Foreground:
- Deals with a specific case or situation and involves the intersection of multiple concepts
- Information available in Journal articles

Foreground Knowledge

Background Knowledge

Clinical Experience
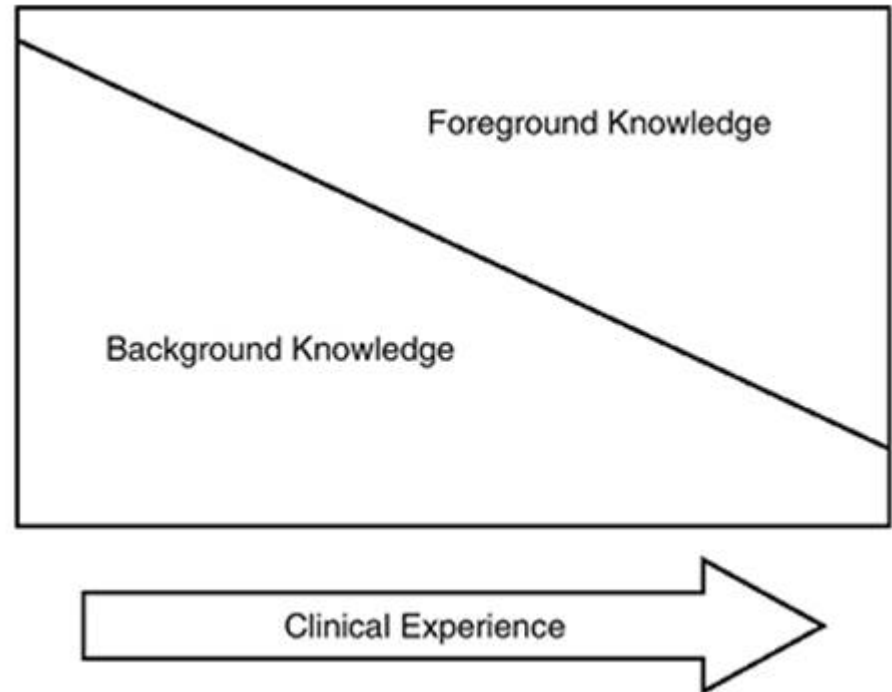
Identifying searchable terms

There are different techniques you can use to extract search terms from a question

- PICO

    - Patient-Problem-Population
    - Intervention
    - Comparison
    - Outcome

- Who, What, Where, When, How, & Why.

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The PICO Method:

A system to help you frame your question into individual search concepts

PICO Method – What it means

- Using the PICO method involves breaking your question down into the following concepts:

PICO Method – Patient/Population/Problem

- Using the PICO method involves breaking your question down into the following concepts:
  - P = Patient/Population/Problem
    - What kind of disease is involved?
    - Who is affected by this issue?
    - What is the problem of interest to you?

PICO Method - Intervention

- Using the PICO method involves breaking your question down into the following concepts:
  - P = Patient/Population/Problem
  - I = Intervention
    - What is being done?
    - What effect is being introduced?

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PICO Method - Comparison

- Using the PICO method involves breaking your question down into the following concepts:
  - P = Patient/Population/Problem
  - I = Intervention
  - C = Comparison
    - What else could be done?

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PICO Method - Outcome

- Using the PICO method involves breaking your question down into the following concepts:
  - P = Patient/Population/Problem
  - I = Intervention
  - C = Comparison
  - O = Outcome
    - What is effect/impact of the intervention on the patient?

Bonus PICO(T) Element – Time/Type of Study

- Using the PICO method involves breaking your question down into the following concepts:
  - P = Patient/Population/Problem
  - I = Intervention
  - C = Comparison
  - O = Outcome
  - T = Time and/or Type of Study

PICO Method – Sample Question

- Let's apply PICO to the following question:

  - Can radiotherapy for oral cancer on patients with dental implants cause them to fail?

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PICO Method

- Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
    - P = Patient/Population/Problem
        - Oral Cancer

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PICO Method

- Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  - P = Oral Cancer
  - I = Intervention
    - Radiotherapy

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PICO Method

- Can radiotherapy for oral cancer on patients with dental implants cause them to fail?

  – P = Oral Cancer

  – I = Radiotherapy

  – C = Comparison

    • Not present

PICO Method

- Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  - P = Oral Cancer
  - I = Radiotherapy
  - C = Null
 - Outcome
    - Failure/Survival of Dental Implants

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PICO Method

- Can radiotherapy for oral cancer on patients with dental implants cause them to fail?
  - P = Oral Cancer
  - I = Radiotherapy
  - C = Null
  - O = Dental Implant Failure/Survival

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PICO Method – Putting it all together

- Can radiotherapy for oral cancer on patients with dental implants cause them to fail?

  = Oral Cancer AND   Radiotherapy AND   Dental Implant Failure/Survival

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PICO - Putting it all together
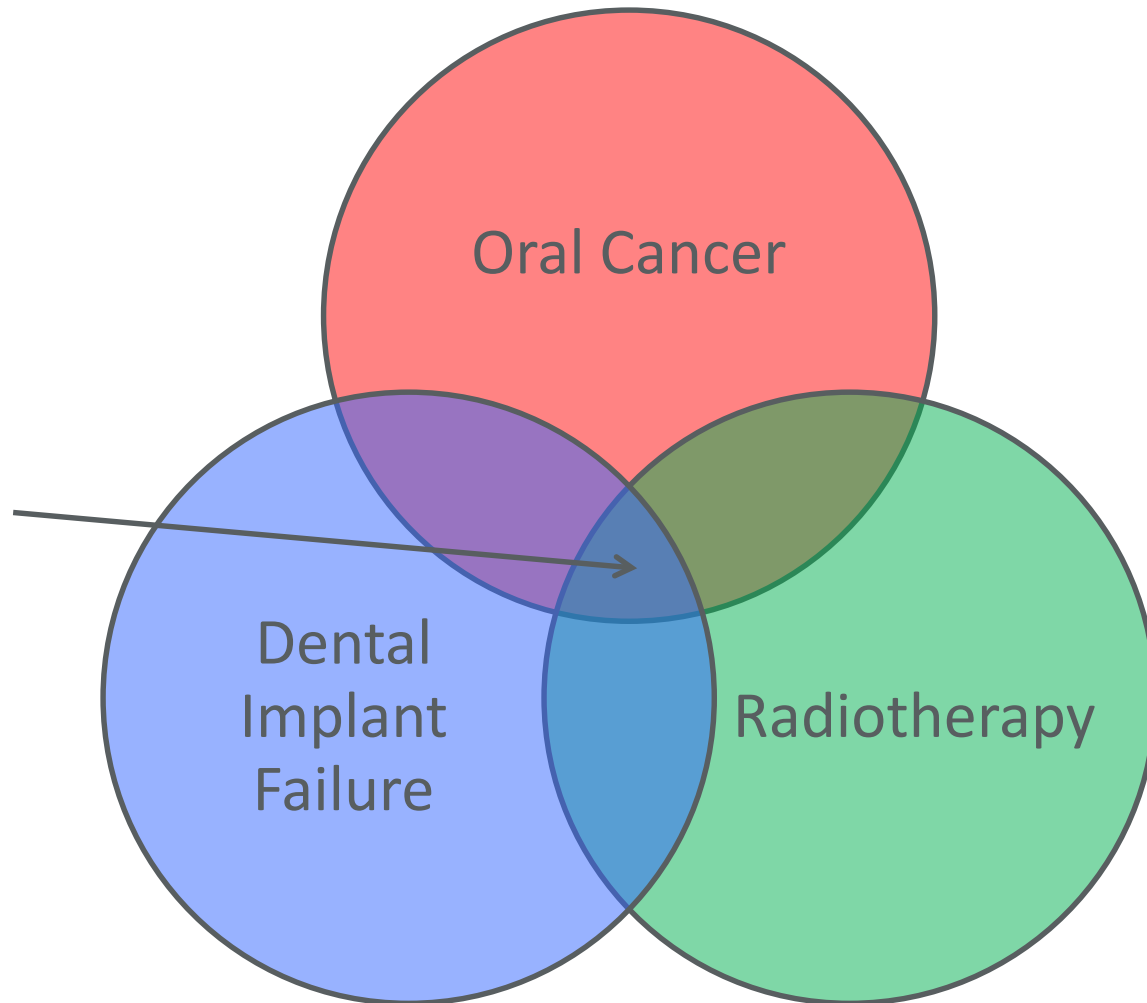
Another way to think about it...

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

In this analogy, the question is the cookie and the search terms are the ingredients that are brought together to create it….

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:
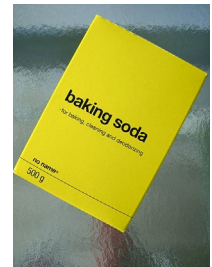
- Flour
- Sugar

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

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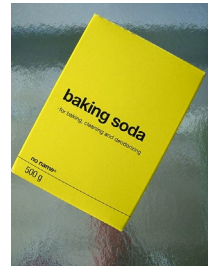
- Flour
- Sugar
- Brown Sugar
- Baking Soda

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
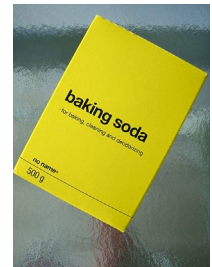- Brown Sugar
- Baking Soda
- Salt

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
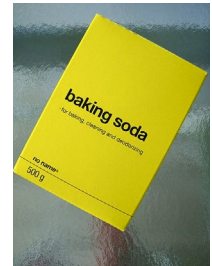- Baking Soda
- Salt
- Chocolate Chips

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
  - Semi-sweet? Dark? Milk? White?
  - Chips? Chunks? Mini-chips?

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

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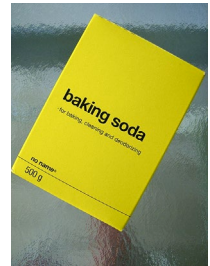- Chocolate Chips
- Vanilla?

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

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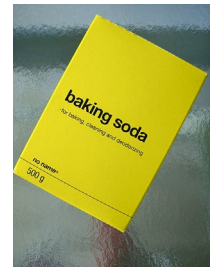- Chocolate Chips
- Vanilla extract

Breaking down your question

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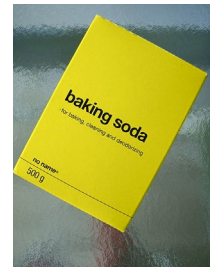- Chocolate Chips
- Vanilla extract
- Eggs?

Breaking down your question

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I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
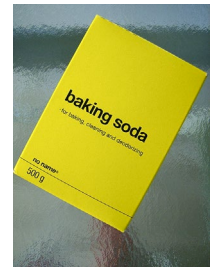- Vanilla extract
- Chicken Eggs

Breaking down your question

To bake a batch of chocolate chip cookies, I need to come up with a recipe and identify the ingredients that will be needed to make them.

I will need to get the following ingredients to make these cookies:

- Flour
- Sugar
- Brown Sugar
- Baking Soda
- Salt
- Chocolate Chips
- Vanilla extract
- Chicken Eggs
- Butter

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What is MeSH?

MeSH Vocabulary tutorial
https://www.nlm.nih.gov/bsd/disted/video/

MeSH Indexing Tutorial
https://www.nlm.nih.gov/bsd/indexing/training/USE_010.html

The Medical Subject Headings (MeSH®) thesaurus is a controlled vocabulary produced by the National Library of Medicine and used for indexing, cataloging, and searching for biomedical and health-related information and documents.

MeSH includes the subject descriptors appearing in MEDLINE®/PubMed®, the NLM catalog database, and other NLM databases.

Why do we need to use MeSH?

- A single word can have significantly different meanings
- Concepts can have a multitude of synonyms
- General concepts are associated with a variety of specific concepts

The word "Jaguar" can refer to:

- A large cat

https://commons.wikimedia.org/wiki/File:Amur_leopard01_960.jpg
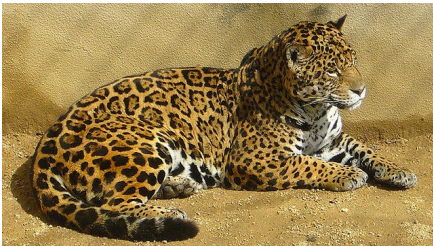
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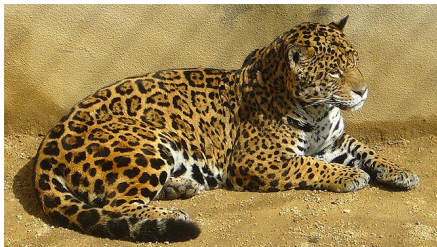
   The word "Jaguar" can refer to:

- A large cat
- A car company

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- A car company
- Mac OS X 10.2
- An NFL team

https://commons.wikimedia.org/wiki/File:Amur_leopard01_960.jpg

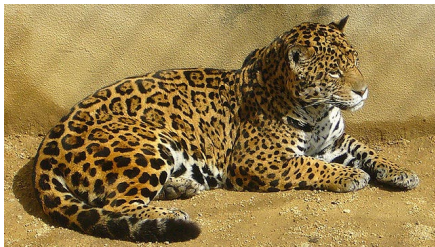https://commons.wikimedia.org/wiki/File:Jaguar_E-Type_Coupe_Series_1_(1967)_-_15149313858.jpg

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Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms

- Consider the following drugs:

  – Tylenol

Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms

- Consider the following drugs:

  - Tylenol
  - Panadol

Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms
- Consider the following drugs:

    - Tylenol
    - Panadol
    - APAP

Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms

- Consider the following drugs:

  - Tylenol
  - Panadol
  - APAP
  - Paracetamol

Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms

- Consider the following drugs:

    – Tylenol
    – Panadol
    – APAP
    – Paracetamol
    – Acetaminophen

Why do we need to use MeSH?

- A single concept can also be referred to by a multitude of synonyms

- Consider the following drugs:

    - Tylenol
    - Panadol
    - APAP
    - Paracetamol
    - **Acetaminophen** = MeSH term

Why do we need to use MeSH?

- General concepts are associated with a variety of more specific concepts

- Consider the relationship between the following conditions:

  - Cardiovascular Disease
  - Heart Disease
  - Cardiac Arrhythmia
  - Tachycardia
  - Ventricular Tachycardia
  - Torsades de Pointes

Why do we need to use MeSH?

- General concepts are associated with a variety of more specific concepts

- Consider the relationship between the following conditions:

>Cardiovascular Disease
  >Heart Disease
    >Cardiac Arrhythmia
      >Tachycardia
        >Ventricular Tachycardia
          >Torsades de Pointes

Why do we need to use MeSH?

- General concepts are associated with a variety of more specific concepts

- Consider the relationship between the following conditions:

- MeSH uses Tree Structures to organize related concepts into hierarchies to allow us to see everything related to a concept.

All MeSH Categories
    Diseases Category
        Cardiovascular Diseases
            Heart Diseases
                Arrhythmias, Cardiac
                    Tachycardia
                        Tachycardia, Ventricular
                          Torsades de Pointes

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Why do we need to use MeSH?

- General concepts are associated with a variety of specific concepts

- MeSH Tree Structures can be used to search for everything related to a general concept

All MeSH Categories
    Diseases Category
        Cardiovascular Diseases
            Heart Diseases
                Arrhythmias, Cardiac
                    Tachycardia
                        Tachycardia, Paroxysmal
                        Tachycardia, Reciprocating
                            Tachycardia, Atrioventricular Nodal Reentry
                            Tachycardia, Sinoatrial Nodal Reentry
                        Tachycardia, Supraventricular
                            Tachycardia, Ectopic Atrial
                            Tachycardia, Ectopic Junctional
                            Tachycardia, Sinus
                    Tachycardia, Ventricular
                      Accelerated Idioventricular Rhythm
                      Torsades de Pointes

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