

Principles of Epistemology

Alex Peek

Preface

The purpose of this essay is to consolidate various principles of epistemology into a single system. Epistemology is the study of knowledge. There are 78 sections organized into seven chapters: Truth, Knowledge, Language, Representation, Reason, Understanding, Phenomena.

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1. Truth

1.1. What is truth?

What is truth? I have two definitions:

- 1. Truth is an accurate representation of reality
- 2. Truth is the actual state of affairs

Below is an explanation of each definition.

1. Truth is an accurate representation of reality

I believe that truth is anything that is an accurate representation. When somebody says that they're telling the truth, they're claiming to be saying something that correctly corresponds to reality. In this regard, every true proposition is the truth.

2. Truth is the actual state of affairs

I believe that the second meaning of truth is equivalent to the word 'reality'. Sometimes people capitalize the word Truth to demonstrate this meaning.

1.2. What is reality?

What is reality? Here is my definition:

Reality is the actual state of affairs

Reality is arguably the most important concept in all of philosophy. Reality determines whether or not our propositions are true. Philosophers and scientists are researchers of reality, with all of them attempting to learn about reality.

1.3. What is true?

What is the definition of true? Here is my definition:

True is the attribute of being an accurate representation of reality

When we talk in our daily lives, we make many propositions about reality. When our propositions correctly display reality, we are saying something that is true. I believe that determining whether a proposition is true or false is central to epistemology.

I believe there are many different methods to determine whether a proposition is true. Logic, reason and intuition are three basic methods for determining the accuracy of a proposition. Controlled experiments are another method that can be useful for determining the accuracy of a proposition. These methods help us form beliefs about reality.

1.4. What is ontology?

What is ontology? Here is my definition:

Ontology is the study of the way something is

I believe that ontology is the overarching study of everything. Whenever we study something, we are always studying the way it is. Even epistemology is a branch of ontology, because in epistemology we are studying the nature of knowledge.

2. Knowledge

2.1. What is knowledge?

What is knowledge? Here is my definition:

Knowledge is a correctly justified true belief

I believe that establishing knowledge is one of the central goals of intellectual activity. The greatest scientists and philosophers have helped humanity establish new knowledge and ideas about reality. Scientists and philosophers should never forget that knowledge is the goal.

According to this definition, knowledge has to be justified. For example, imagine that you say, "My next roll with the dice will be a six." Even if this statement is true, it's not knowledge because you do not have justification to believe it.

It's also necessary that knowledge is correctly justified. This means that correct justification has to be used. I regard this as a solution to the Gettier problem proposed by Edmund Gettier in 1963. Gettier believed that the definition 'justified true belief' was inadequate to define knowledge. The next paragraph is a Gettier case to demonstrate this problem.

Imagine that you observe 1 sheep standing in a field 100 yards away, but it's actually a highly realistic cardboard sheep. Since the cardboard sheep is very realistic, it serves as adequate justification to believe that there is 1 sheep in the field. This belief is also true because there is 1 sheep hidden behind a bush next to the cardboard sheep. Even though this belief is justified and true, is it knowledge? No, because you used the incorrect justification. In this regard, I believe that knowledge has to use correct justification.

I also believe that knowledge also has to be true. I do not consider incorrect beliefs as knowledge. I believe it's necessary for knowledge to accurately represent reality.

2.2. What is epistemology?

What is epistemology? Here is my definition:

Epistemology is the study of knowledge

I believe that every branch of knowledge (physics, economics, neuroscience, ontology, etc.) is reliant on epistemology. Everything you accept as true is based on your personal system of epistemology. Even ethics is reliant on epistemology because everything we know about ethics is a form of knowledge. Below are a few quotes that emphasize the importance of epistemology.

Albert Einstein (1879-1955, physicist):

"When I think about the ablest students whom I have encountered in my teaching, that is, those who distinguish themselves by their independence of judgment and not merely their quick wittedness, I can affirm that they had a vigorous interest in epistemology." (Physikalische Zeitschrift, 1916)

Edwin Arthur Burt (1892-1989, philosopher):

"The central place of epistemology in modern philosophy is no accident." (The Metaphysical Foundations of Modern Physical Science, 1925)

Rene Descartes (1596-1650, philosopher):

"No more useful inquiry can be proposed than that which seeks to determine the nature and the scope of human knowledge." (Rules for the Direction of the Mind, 1628)

Simone Weil (1909-1943, philosopher):

"The most important part of education - to teach the meaning of to know." (Waiting on God, posthumous 1950)

2.3. What is justified?

What is justified? Here is my definition:

Justified is the attribute of being supported by a good reason

I believe there is a subjective line between justified and not-justified. I don't have a strict criteria for what constitutes as a good reason. For example, if I hear music playing loud next door, am I justified to believe they are having a party? Depending on who you ask, the answer could be yes or no. What constitutes as a 'good reason' is subjective.

2.4. What is a belief?

What is a belief? Here is my definition:

A belief is a representation accepted as true

In our daily lives we form many beliefs about reality. For example, if you mail a package to your friend, you would probably believe that the delivery will arrive someday. Our lives are filled with many beliefs like this.

Over the course of a lifetime, a person will form a giant list of beliefs about reality. Many of these beliefs will become forgotten and buried in our subconscious, but as long as they are subconsciously accepted to be true, I believe they qualify as a belief.

2.5. Fundamentals of belief

This is a collection of some quotes about beliefs. There are 12 quotes divided into 5 sections.

- A. Something accepted as true is a belief (3)
- B. Every belief is a representation of reality (1)
- C. In life, an individual forms a web of beliefs (2)
- D. Ideally, every belief should be in congruence with all other beliefs (4)
- E. People agree on most aspects of reality (2)

A. Something accepted as true is a belief

David Hume (1711-1776, philosopher):

1. "In our reasonings concerning matter of fact, there are all imaginable degrees of assurance, from the highest certainty to the lowest species of moral evidence. A wise man, therefore proportions his beliefs to the evidence." (An Enquiry Concerning Human Understanding, 1748)

Rene Descartes (1596-1650, philosopher):

2. "The aim of our studies must be the direction of our mind so that it may form solid and true judgments on whatever matters arise." (Rules for the Direction of the Mind, 1628)

Gottlob Frege (1848-1925, philosopher):

3. "A judgement for me is not the mere grasping of a thought, but the admission of it's truth." (On Sense and Reference, 1892)

B. Every belief is a representation of reality

Plato (427-348 BC , philosopher):

4. "All that is said by us can only be imitation and representation." (Critas)

C. In life, an individual forms a web of beliefs

Ludwig Wittgenstein (1889-1951, philosopher):

5. "What I hold fast to is not one proposition but a nest of propositions." (On Certainty, posthumous 1969)

Ludwig Wittgenstein (1889-1951, philosopher):

6. "The child learns to believe a host of things, i.e. it learns to act according to those beliefs. Bit by bit there forms a system of what is believed, and in that system, some things stand unshakably fast and some are more or less liable to shift. What stands fast does so, not because it is intrinsically obvious or convincing; it is rather held fast by what lies around it." (On Certainty, 1969 posthumous)

D. Ideally, every belief should be in congruence with all other beliefs

Otto Neurath (1882-1945, philosopher):

7. "Every new statement is to be confronted with existing ones, already brought to a state of harmony between themselves. A statement will be considered correct if it can be joined to them." (Soziologie im Physikalismus, 1931)

Bertrand Russell (1872-1970, philosopher)

8. "Reason is a harmonising, controlling force rather than a creative one." (Our Knowledge of the External World, 1914)

Willard van Orman Quine (1908-2000, philosopher):

9. "Implication is thus the very texture of our web of belief, and logic is the theory that traces it." (The Web of Belief, 1970)

Richard von Mises (1883-1953, mathematician):

10. "No contradiction exists, if the events are correctly interpreted." (Probability, Statistics and Truth, 1957)

E. People agree on most aspects of reality

William James (1842-1910, philosopher):

11. "The most violent revolutions in an individual's belief leave most of his old order standing. Time and space, cause and effect, nature and history, and one's own biography remain untouched." (What Pragmatism Means. Lectures at the Lowell Institute and Columbia University, 1931)

G. E. Moore (1873-1958, philosopher):

12. "I can prove now, for instance that two human hands exist. How? By holding up my two hands and saying, as I make a certain gesture with the right hand, 'here is one hand' and adding, as I make a certain gesture with the left, 'and here is the another'." (Proof of an External World, 1939)

2.6. What is a priori, a posteriori, analytic and synthetic knowledge?

What is a priori, a posteriori, analytic and synthetic? I have 4 definitions below:

A priori knowledge is acquired without experience

A posteriori knowledge is acquired through experience

Analytic knowledge is the meaning of a concept

Synthetic knowledge extends beyond the meaning of a concept

Using these four definitions, we can divide knowledge into four types: a priori analytic, a priori synthetic, a posteriori analytic and a posteriori synthetic.

Before describing each type of knowledge, I should mention that I believe all thoughts are experiences. This makes all thoughts a posteriori knowledge. For example, imagine that you climb a mountain. When you get to the top, you have the thought that you've accomplished a great feat and you're proud of yourself. I believe that this conscious awareness is an experience. The same goes for any emotion or idea you experience.

A priori analytic

A priori analytic is knowledge of the meaning of a concept without experience. I believe that a priori analytic knowledge doesn't exist, because all definition retrieval occurs within the bounds of experience. For example, imagine that you ask yourself the meaning of the word 'fence'. To answer this question, your mind needs to retrieve a mental representation of what 'fence' means. I believe this definition retrieval would be an experience, thereby making it a posteriori knowledge.

A priori synthetic

A priori synthetic is knowledge that extends beyond the meaning of a concept without experience. I believe that a priori synthetic knowledge doesn't exist, because I regard all mental activity as an experience. In this regard, every belief that I have about reality was initially based on a previous experience in my life.

I also believe that mathematical equations are known a posteriori. For example, take the equation $86 + 14 = __$. To demonstrate this, imagine that you combine 86 apples with 14 apples and then count the total. Even if you count the same total a million times in a row, there is still a chance that you miscounted every time. Even if you do this exercise entirely in your mind, you could potentially make the same mistake. We need experience (physical or mental) to determine the answer. For this reason, I believe that all mathematical equations are known a posteriori.

A posteriori analytic

A posteriori analytic is knowledge of the meaning of a concept through experience. For example, imagine that you ask yourself the meaning of the word 'rock'. To answer this question, your mind needs to retrieve a mental representation of what 'rock' means. This inquiry would tap into your past experiences and look for instances when objects were labeled as a 'rock'. I believe this picture retrieval would be an experience, therefore making it a posteriori knowledge.

A posteriori synthetic

A posteriori synthetic is knowledge that extends beyond the meaning of a concept through experience. For example, think about the proposition, 'There is a bowl in the kitchen'. This proposition is synthetic because the definition of 'bowl' doesn't include 'in the kitchen'. The proposition is also a posteriori because it would be impossible to know whether it was true or false without first-hand experience or mental reasoning.

3. Language

3.1. What is language?

What is language? Here is my definition:

Language is written or spoken symbols

I believe that language extends beyond words. For example, the peace symbol is a form of language, yet it is not a word. Another example, the power symbol used for turning on a computer is language, yet it is also not a word.

I also believe that language excludes symbols that are not written or spoken. For example, a crown is a symbol of royalty, but it is not language. Another example, a large beard is a symbol of intelligence, but it is not language. These are two examples of symbols that are not language.

Despite its name, I believe that body language is not a language because body language is not written or spoken. Instead, body language is a sign that conveys data. In this regard, it should be called 'body signs'.

3.2. Fundamentals of language

This is a collection of some quotes about language. There are 16 quotes divided into 5 sections.

- A. Every word corresponds to a concept (or multiple concepts) (3)
- B. Language is almost always subjective to a degree (2)
- C. Grammar enables multiple words to express a more complex meaning (3)
- D. Ideas come long before the proper words to describe them (4)
- E. Language is central to every branch of knowledge (4)

A. Every word corresponds to a concept (or multiple concepts)

Ludwig Wittgenstein (1889-1951, philosopher):

1. "Uttering a word is like striking a note on the keyboard of imagination." (Philosophical Investigations, posthumous, 1963)

Albert Einstein (1879-1955, physicist):

2. "Concepts have meaning only if we can point to objects to which they refer and to rules by which they are assigned to these objects." (Ernst Mach Memorial Notice, 1916)

Benjamin Whorf (1897-1941, linguist):

3. "We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way..." (Language, Thought and Reality, 1956)

B. Language is almost always subjective to a degree

Ludwig Wittgenstein (1889-1951, philosopher):

4. "For remember that in general we don't use language according to strict rules; it hasn't been taught to us by means of strict rules either." (The Blue Book, posthumous 1958)

John Langshaw Austin (1911-1960, philosopher):

5. "Faced with the nonsense question, 'what is the meaning of a word?' and perhaps dimly recognizing it to be nonsense, we are nevertheless not inclined to give it up." (Philosophical Papers, posthumous 1979)

C. Grammar enables multiple words to express a more complex meaning

Stanley Fish (1938-now, literary critic):

6. "Before the words slide into their slots, they are just discrete items pointing everywhere and nowhere." (How to Write a Sentence and How to Read One, 2011)

William Cobbet (1763-1835, journalist):

7. "Grammar, perfectly understood enables us, not only to express our meaning fully and clearly, but so to express it as to enable us to defy the ingenuity of man to give to our words any other meaning than that which we ourselves intend them to express." (A Grammar of the English Language, 1818)

Rudolf Carnap (1891-1970, philosopher):

8. "By the logical syntax of language, we mean the formal theory of the linguistic forms of that language - the systematic statement of the formal rules which govern it together with the development of the consequences which follow from these rules." (Logical Syntax of Language, 1934)

D. Ideas come long before the proper words to express them

Marianne Moore (1887-1972, poet):

9. "I've always felt that if a thing had been said the best way, how can you say it better?" (Paris Review Interview, 1960)

Sallie McFague (1933-2019, theologian):

10. "A metaphor is a word used in an unfamiliar context to give us a new insight; a good metaphor moves us to see our world in an extraordinary way." (Speaking in Parables, 1975)

Marlene Dietrich (1901-1992, actress):

11. "I love quotations because it is a joy to find thoughts one might have beautifully expressed with much authority by someone recognizably wiser than oneself." (Quoted in Presidential Wit and Wisdom by Brallier and Chabert)

John Searle (1932-now, philosopher):

12. "You cannot think clearly if you cannot speak and write clearly." (The Storm Over the University, 1990)

E. Language is central to every branch of knowledge

Friedrich Nietzsche (1844-1900, philosopher):

13. "We have seen how it is originally language which works on the construction of concepts, a labor taken over in later ages by science." (On Truth and Lie in an Extra-Moral Sense, 1873)

Stephen Jay Gould (1941-2002, biologist):

14. "The nature of true genius must lie in the elusive capacity to construct these new modes from apparent darkness." (The Flamingo's Smile, 1985)

Rachel Carson (1907-1964, biologist):

15. "If there is poetry in my book about the sea, it is not because I deliberately put it there, but because no one could write truthfully about the sea and leave out the poetry." (National Book Award for Nonfiction speech, 1952)

Felix Frankfurter (1882-1965, lawyer):

16. "All our work, our whole life is a matter of semantics, because words are the tools with which we work, the material of which laws are made, out of which the constitution was written. Everything depends on our understanding of them." (Quoted in Readers' Digest, 1964)

3.3. What is a word?

What is a word? Here is my definition:

A word is a symbol consisting of letters, phonetic sounds or conventional gestures

I believe that words are portable concepts. For example, think of the word 'wall'. To establish the word 'wall', we can point to multiple examples of walls and say 'wall'. After this process, the word 'wall' becomes an established tool to convey the concept of a wall. Saying the word 'wall' is much easier than pointing to the concept it represents.

Another common way to establish a word is to provide a definition. A definition is a statement of the meaning of a word. This method is only possible once we have already established a large variety of other words.

3. 4. What is a name?

What is a name? Here is my definition:

A name is a word that designates something

I believe that words and names have a perfect overlap, but have slightly different meanings. Every word is a name for a concept, and every name is a word. Here is the difference: the emphasis of a name is designation, whereas the emphasis of a word is the collection of letters or phonetic sounds. For example, think of a name tag. It wouldn't make sense to say, "Hello my word is: ". This is because your personal name is primarily a designation. It's not as important that your personal name is a collection of letters or phonetic sounds.

3.5. What is a symbol?

What is a symbol? Here is my definition:

A symbol is something that represents a concept

I believe that behind every symbol is a concept. Symbols are portable concepts. In this regard, symbols are useful for communicating efficiently and making propositions.

Although many symbols are completely abstract (such as the peace sign), there are some symbols that have a physical relation to the meaning. For example, imagine the up arrow symbol. This symbol resembles the thing it represents. In this regard, an up arrow symbol is not abstract.

3.6. What is a concept?

What is a concept? Here is my definition:

A concept is a mental general representation

I believe that generality is the essential aspect of a concept. For example, think of the concept 'grass'. The concept of 'grass' refers to a wide range of things. It refers to all the different types of grass and the entirety of everything grass stands for. In this regard, the concept of 'grass' is general.

I also believe that concepts are representations. For example, the concept 'fork' is not an actual fork, but instead it is a representation of a fork. In this regard, a concept represents all of the real examples of that concept.

Concepts are mental because they only exist in the mind. Reality is full of potential concepts and only the mind or viewer can create concepts.

3.7. What is a form?

What is a form? Here is my definition:

A form is a general representation

I believe that forms are very similar to concepts. Concepts and forms are both general representations that we establish to interpret reality.

From my understanding, Plato believed that every particular form we encounter in life has a corresponding transcendental ideal form. For example, if we see a frog then there is a corresponding ideal form of a frog that exists in transcendental reality. This also applies to every concept such as justice, horse and courage. Plato also believed that above all the ideal forms there is a 'Form of the Forms' which permeates the entire system.

According to Plato, the world of transcendental forms is the most true reality. Plato believed that when we recognize a horse, we are actually remembering the ideal form of the horse that we knew before we were born. In this regard, forms are not based on experience but are rather based on remembering the ideal form.

Aristotle disagreed with Plato and believed that forms are created through experience rather than remembering an ideal form. For example, we can establish the form of a horse by experiencing multiple examples of horses. Through experience we can figure out a commonality to every particular horse and label this concept. Aristotle's theory of forms does not rely on remembering the ideal form.

I agree more with Aristotle on this topic. I believe that reality is full of potential forms and the conscious mind establishes these forms. Upon establishing a form, the ideal form is stored in the mind. In this regard, ideal forms existing in the mind could be considered as transcendental, but I do not think there's a list of ideal forms that exists in a perfect transcendental realm.

It should also be mentioned that reality has an unlimited amount of potential forms. For example, we can establish the form for when a computer is on top of a stack of books and call it 'X'. It seems strange to think that an ideal version of 'X' exists in a metaphysical reality.

3.8. What is a meaning?

What is a meaning? I have two definitions:

1. A meaning is an underlying representation

2. A meaning is an underlying significance

Below is an explanation of each definition.

1. A meaning is an underlying representation

When it comes to linguistic meaning, I believe we should divide meanings into two main types: implied and literal. The literal meaning refers to the primary meaning of the words, while the implied meaning has to do with something not explicitly stated. For example, think about the sentence, 'I'm hungry'. The literal meaning is that the speaker is experiencing the feeling of hunger. The implied meaning could be that the speaker wants to get some food.

2. A meaning is an underlying significance

The second definition of meaning has to do with significance. For example, think of the question, 'What is the meaning of life?' In other words, I believe this question is also saying, 'What is the significance of life?' In this regard, the meaning of life is the underlying importance of reality and our experience.

3.9. What is a definition?

What is a definition? Here is my definition:

A definition is a statement of the meaning of a word

I believe that most words have multiple meanings. Therefore, most words have multiple definitions. To deal with this, the first step in creating a definition is to figure out which meaning will be targeted.

When making a definition, it's important to include all of the instances that qualify and exclude all of the instances that do not qualify. Sometimes this can be very tricky, because some words represent complex concepts. I believe a good method for making a definition is to think of examples of the word being used and try to find the common denominator.

I also believe that judging the adequacy of a definition is always subjective to a degree. For example, take my definition of 'definition': a statement of the meaning of a word. Would this definition be better if I replaced the word 'meaning' with my definition of 'meaning': an underlying representation? This replacement would cause the new definition to be: a statement of the underlying representation of a word. Is the new definition better? Although I think it's close, I believe the first definition is subjectively better due to its simplicity.

3.10. What is establishment?

What is the definition of establishment? Here is my definition:

Establishment is the process of causing something indefinitely into existence

I believe that language is formed through establishment rather than usage. For example, imagine that we have a million different color shades and we want to give a word to each shade. In this situation, we could name every color a separate number. This process would establish many word-concept relationships. Although we wouldn't use every color shade, the meanings would still remain. This example shows how usage is not necessary for a word to have meaning.

What if somebody starts using a word in a new way? Would this be a case where usage precedes establishment? I don't think so because the usage of a new meaning is simultaneous to the establishment of that meaning. In this regard, usage and establishment occur at the same time, but establishment is more important for creating meaning.

If somebody uses a word incorrectly, does this change the meaning of the word? I don't think so because it goes against the established meaning. Maybe with enough misuses, a new meaning can get established to coincide alongside the original meaning, but still establishment is what truly gives a word meaning. This is another example of how usage does not predominate over establishment.

3.11. What is literal?

What is literal? Here is my definition:

Literal is according to the primary meaning of language

I believe that almost every word in the English language has multiple meanings. For example, the word 'argument' could mean a verbal disagreement between two people or it could mean a set of reasons to support a belief. Another example, the word 'time' could mean a specific occasion or it could mean the entire phenomena of past, present and future.

I also believe this issue becomes bigger when we consider the most basic words. For example, the word 'for' could indicate a length of time or an occasion in a series. Another example, the word 'in' could mean that something is surrounded by something else or refer to a condition.

These examples show that being perfectly literal is somewhat of an elusive task. For most words, it's not clear what the primary meaning is. In this regard, we can only subjectively choose what we believe is the most literal meaning.

When I write, I try to be as literal as possible to minimize the chance of being misunderstood. I believe it's important to be clear and make writing easy to read. I don't want people to read my writing and ask, "What does he mean here?" Instead, I want the meaning to be clearly represented. Although I can never fully accomplish this goal, I believe it's a good thing to aim for.

3.12. What is a sentence?

What is a sentence? Here is my definition:

A sentence is an unified segment of words that has at least one subject-predicate pair and follows grammatical rules

The subject of a sentence is the piece of reality that is selected, while the predicate describes that piece. For example, in the sentence 'John ran to the store', 'John' is the subject and 'ran to the store' is the predicate. Some sentences have multiple subject-predicate pairs such as, 'John ran to the store but the store was closed'.

Some sentences have an implied subject or predicate. For example, in the sentence 'Pay your taxes', the subject 'you' is implied and part of the predicate, 'should' is also implied.

I believe that the only syntactic rule common to all languages is the subject-predicate pair. I believe if you compared languages from around the world, you would not find a uniform consistency in the way words are ordered. The only syntactic consistency you would find is the subject-predicate pair. In this regard, I believe it's impossible for a language to say anything about reality without a subject-predicate pair.

3.13. What is grammar?

What is grammar? Here is my definition:

Grammar is a system of rules for the combination and formation of words

I believe that babies learn grammar primarily through example. Over time, babies are able to catch onto the patterns of how nouns, adjectives and verbs relate to each other. They also figure out the way certain words are used. In this regard, grammar is something that is imitated.

3.14. What is syntax?

What is syntax? Here is my definition:

Syntax is a system of rules for the combination of words

What's the difference between syntax and grammar? While syntax is concerned with the ordering of words, grammar has a wider scope which includes how words are formed. Grammar includes morphology which has to do with rules on how to use prefixes, root words and other word variations. Although these two words have a large overlap, I believe there is a clear difference in meaning.

Without syntax, there would not be rules for how words in a sentence relate to each other. This would result in confusion and misinterpretation. For example if I said, "Crayons the box are in 64 there" you might be unclear on the meaning. But if I followed the correct syntactic rules I would have said, "There are 64 crayons in the box" and you would be able to understand. Although you might have been able to guess the meaning from the first collection of words, syntax makes the second collection much more clear.

3.15. What is clear?

What is clear? Here is my definition:

Clear is the attribute of being easy to understand

When I write, I try to be as clear as possible. When I write about an idea, the first draft usually has many problems. Some sentences might have unnecessary or incorrect words.

Overall, I believe that clear writing depends on how well the author can translate a thought into words. This process can be difficult because some thoughts are mysterious and complicated. In this regard, clear writing is related to phenomenology.

3.16. What is subjective?

What is subjective? Here is my definition:

Subjective is the attribute of being open to interpretation

Subjective words can be very useful for describing reality. I believe there are aspects of reality that can only be described using subjective words. By excluding subjective descriptions, one becomes limited in their ability to describe reality.

Some people argue that subjective statements don't have a truth value, but I disagree with that view. I believe that subjective statements are capable of being accurate representations of reality. Although we can't conclusively prove that a subjective description is true, we can have a large degree of certainty behind a subjective description.

3.17. What is objective?

What is objective? Here is my definition:

Objective is the attribute of not being open to interpretation

Think of the number 4. To establish the definition of 4, we can point to groupings of 4. Each example helps establish the meaning. The meaning of 4 is an objective concept which can be easily differentiated from the meaning of 3. I believe this idea also applies to mathematical forms such as squares and circles. We can point to examples of squares and non-squares in order to establish the objective meaning of a square.

What about the word 'open'? I believe this word is subjective for two reasons. First, there is not a strict line that determines when an object is 'open' from when it is not. Second, there are multiple meanings of the word 'open' therefore its meaning is dependent upon the subjective context.

The situation is more complicated for propositions. With two exceptions, I believe it's impossible to make a 100% objective proposition about reality. The only exceptions I can think of are mathematical equations such as $2 + 3 = 5$ and symbolic logic equations. I believe some of the most objective looking statements can be twisted to be purposefully misinterpreted. I have listed two examples below.

1. 'Ben's car is in the driveway'. This statement appears to have an objective meaning, but the word 'in' could potentially be interpreted as 'inside'. This would mean that the pieces of the car are embedded into the cement of the driveway. Of course this is ridiculous, but it shows one possible interpretation of the words.
2. 'Mary owns 2 cars'. Here I see two words that could be misrepresented, 'own' and 'cars'. What is the definition of a 'car'? What is the definition of 'own'? These words can have many different meanings. Therefore, I think this statement is not 100% objective.

Instead of trying to differentiate between objective and subjective propositions, I think of propositions as existing on a continuum of objective and subjective. I believe there are too many unseen misinterpretation

traps to safely conclude that a statement is 100% objective (except for mathematics and logic symbols). For this reason, I believe that the word 'objective' is subjective.

4. Representation

4.1. What is a representation

What is a representation? Here is my definition:

A representation is something that stands for the actual thing

In an earlier section, I said that establishing knowledge is one of the central goals of intellectual activity. If establishing knowledge is a central goal, another goal is to create true physical representations of reality. This includes all of our models, descriptions, equations and illustrations. For example, the equation $E=MC^2$ is a representation of a real world phenomenon. Another example, the *Mona Lisa* by Leonardo da Vinci is believed to be a representation of Lisa del Giocondo. In this regard, all of our written and spoken knowledge is a representation.

4.2. What is a proposition?

What is a proposition? Here is my definition:

A proposition is a representation to be considered

I believe that propositions are not necessarily beliefs. Sometimes people make propositions for the purpose of evaluation rather than asserting their opinion. In this regard, a proposition is a tool to help people organize their thoughts. Philosopher Ludwig Wittgenstein once said,

"If a false thought is so much as expressed boldly and clearly, a great deal has already been gained." (Culture and Value, posthumous 1980)

4.3. What is a description?

What is a description? Here is my definition:

A description is a linguistic representation

I believe that all descriptions use language. Descriptions are a particular type of representation which use words to convey things. Descriptions can be contrasted with other types of representations such as models and pictures.

Although we can use pictures to display information, sometimes it's more effective to use words. This is why we often see captions attached to pictures. In this regard, descriptions have greater potential to provide knowledge than images alone.

4.4. What is an explanation?

What is an explanation? I have two definitions:

An explanation is a description of why something happened or happens

An explanation is a description that makes something clear

Explanations are important for understanding reality. Sometimes we encounter mysterious phenomena that put us in a state of wonder. Explanations shine light on the mysteries of reality.

I believe there's not a sharp line between what information qualifies as an explanation and what doesn't. In this regard, we subjectively determine the most important aspects to include in an explanation. Remember that clarity and understanding is the goal. An explanation can be as short as a single sentence.

4.5. What is mathematics?

What is mathematics? Here is my definition:

Mathematics is the study of numbers, lines and shapes

How does mathematics relate to logic? Logic is the process of forming conclusions using objective reasons or premises. I believe that logic and mathematics overlap when it comes to mathematical equations. For example, imagine that you are trying to figure out the length of the long side on a right triangle and you already know the lengths of the two short sides ($a = 4$, $b = 3$). To answer this question, you could use the Pythagorean theorem: $a^2 + b^2 = c^2$. Now we can solve the equation using logic:

1. $a^2 + b^2 = c^2$
2. $a = 4$

3. $b = 3$
4. Therefore, $c = 25$

I believe that solving this equation is simultaneously mathematics and logic. In this example, there are objective principles that form a conclusion and simultaneously there are numbers, lines and a shape.

I also believe that the part of mathematics that is not logic, has to do numbers, shapes and lines in themselves. For example, think about the mathematical concept of a square. A square in itself is not a process of forming a conclusion. Therefore, shapes in themselves are not logic. The same can also be said for lines and numbers. For example, the number 8 is not a process of forming a conclusion.

To show how logic can stand on its own separate from mathematics, observe this logical argument:

1. All humans are mortal
2. Socrates is a human
3. Therefore, Socrates is mortal

This logical argument is not mathematics because there are no numbers, lines or shapes being referred to. I believe this is a clear example of non-mathematical logic.

4.6. Fundamentals of mathematics

This is a collection of some quotes about mathematics. There are 17 quotes divided into 6 sections.

- A. Mathematics is the study of numbers, lines and shapes (3)
- B. Mathematics is not the material that reality is made out of (2)
- C. Mathematics is a catalogue of representations (3)
- D. Geometrical descriptions cannot be exact to physical reality (3)
- E. Mathematical truths are discovered within experience (3)
- F. Mathematical equations are logic (3)

A. Mathematics is the study of numbers, lines and shapes

W. E. B. Du Bois (1868-1963, sociologist):

1. "When you have mastered numbers, you will in fact no longer be reading numbers, any more than you read words when reading books. You will be reading meanings." (Goodreads.com)

John Dee (1527-1608, mathematician):

2. "It is by the straight line and the circle that the first and most simple examples and representation of all things may be demonstrated..." (Monas Hieroglyphica, 1564)

Graham Flegg (1924-now, mathematician):

3. "Geometry is the most visual of the mathematical disciplines." (Numbers: Their History and Meaning, 1983)

B. Mathematics is not the material that reality is made out of

Ernest Rutherford (1871-1937, physicist):

4. "When we have found how the nucleus of atoms is built up we shall have found the greatest secret of all - except life. We shall have found the basis of everything - of the earth we walk on, of the air we breathe, of the sunshine, of our physical body itself, of everything in the world, however great or however small - except life." (Quoted in The Wit and Wisdom of the 20th Century by Frank Pepper)

Freeman Dyson (1923-2020, physicist):

5. "The real world is muddy and messy and full of things we do not yet understand." (Missed Opportunities, 1972)

C. Mathematics is a catalogue of representations

Tobias Dantzig (1884-1956, mathematician):

6. "The mathematician may be compared to a designer of garments, who is utterly oblivious of the creatures whom his garments may fit." (Number: The Language of Science, 1930)

Michio Kaku (1947-now, physicist):

7. "Mathematics... is the set of all possible self-consistent structures..." (Hyperspace, 1995)

John von Neumann (1903-1957, mathematician):

8. "A large part of mathematics which becomes useful developed with absolutely no desire to be useful, and in a situation where nobody could possibly know in what area it would become useful; and there were no general indications that it ever would be so." (The Role of Mathematics in the Sciences and in Society, 1954)

D. Geometrical representations cannot be exact to physical reality

William Whewell (1794-1866, philosopher):

9. "And so no force however great can stretch a cord however fine into a horizontal line which is actually straight." (Elementary Treatise on Mechanics, 1819)

John von Neumann (1903-1957, mathematician):

10. "If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is." (Remarks at the Association for Computing Machinery Annual Meeting, 1947)

Richard von Mises (1883-1953, mathematician):

11. "I am prepared to concede without further argument that all the theoretical constructions, including geometry, which are used in the various branches of physics are only imperfect instruments to enable the world of empirical fact to be reconstructed in our minds." (Probability, Statistics and Truth, 1957)

E. Mathematical truths are discovered within experience

John Locke (1632-1704, philosopher)

12. "No man's knowledge here can go beyond his experience." (An Essay Concerning Human Understanding, 1689)

G. H. Hardy (1877-1947, mathematician):

13. "I believe that mathematical reality lies outside us, that our function is to discover or observe it, and that the theorems which we prove, and which we describe grandiloquently as our 'creations', are simply our notes of our observations." (A Mathematician's Apology, 1941)

Leonhard Euler (1707-1783, mathematician):

14. "Yet, in fact, as I shall show here with very good reasons, the properties of the numbers known today have been mostly discovered by observation, and discovered long before their truth has been confirmed by rigid demonstrations." (Quoted in Induction and Analogy in Mathematics by George Polya)

F. Mathematical equations are logic

Bertrand Russell (1872-1970, philosopher):

15. "Pure mathematics consists entirely of assertions to the effect that, if such and such proposition is true of anything, then such and such another proposition is true of that thing." (Mathematics and Metaphysics, 1917)

Gottlob Frege (1848-1925, philosopher):

16. "Arithmetic thus becomes simply a development of logic and every preposition of arithmetic a law of logic albeit a derivative one. To apply arithmetic in the physical sciences is to bring logic to bear on observed facts; calculation becomes deduction." (The Foundations of Arithmetic, 1893)

Robert Chambers (1802-1871, geologist):

17. "The study of mathematics, generally, is also of great importance in cultivating habits of exact reasoning; and in this respect it forms a useful auxiliary to logic." (Chamber's Information for the People, 1875)

4.7. What is a number?

What is a number? Here is my definition:

A number is a word that represents a quantity of units

I believe that quantity is a fundamental aspect of numbers. I can't imagine a number that doesn't represent a quantity. Maybe a mathematician could prove me wrong, but I don't see how a number could represent a quality instead of a quantity.

I also believe that numbers are objective. Think of the number 2. To establish the definition of 2, we can point to groupings of 2. In this regard, the meaning of 2 can be clearly differentiated from the meaning of 3. For this reason, I believe that numbers have an unmistakable meaning.

4.8. What is exact?

What is exact? Here is my definition:

Exact is the attribute of being precisely accurate

I believe that exact shapes do not exist in physical reality. For example, imagine a circle created using a high-tech computer with extremely fine ink. This circle would not be an exact circle because there would be some ink molecules slightly out of place.

5. Reason

5.1. What is reason?

What is reason? Here is my definition:

Reason is the process of forming conclusions using explicit justifications or premises

I believe that whenever we use explicit reasons to form a belief, we are performing reason. Reason is the evaluation of reasons to make a conclusion. Reason can be contrasted with intuition which relies on unclear reasons rather than explicit reasons.

I also believe that science relies on reason. Science is a method of establishing knowledge through controlled experiments. When we construct a controlled experiment, we need to consider all the potential confounding variables. Therefore, we need to form reasons why we think the experiment is controlled and adequate for testing a theory.

5.2. What is a reason?

What is a reason? I have two definitions:

1. A reason is something intended to support the accuracy of a proposition
2. A reason is something that explains something else

Below is an explanation of each definition.

1. A reason is something intended to support the accuracy of a proposition

I believe that reasons play a central role in epistemology. Whenever we form a belief, it's usually going to be based on reasons, conscious or unconscious. I also believe that the core essence of a reason is support. The purpose of a reason is to reinforce or strengthen a proposition.

2. A reason is something that explains something else

A reason can also be used to explain something. Whenever somebody asks why something is a certain way, the answer will always be a reason (or reasons). For example, imagine that you go on a bike ride for exercise. If somebody asks you why you went on the bike ride, you would tell them the reason: for exercise. Another example, if somebody asks you why the moon orbits around the Earth, you would tell them the reason: Earth's mass has a gravitational pull on the moon.

What's the difference between an explanation and a reason? An explanation is based on language, while a reason doesn't have to be stated in language. A reason always exists before it is put into words.

5.3. Fundamentals of reason

This is a collection of some quotes about reason. There are 15 quotes divided into 5 sections:

- A. Reasons fit together to support or deny a proposition (2)
- B. Sensory experience is the source of all evidence (2)
- C. It's impossible to 100% prove or disprove a proposition (except for a few absolute facts) (2)
- D. Controlled experiments are a good source of evidence (4)
- E. Disagreements are impossible to resolve when people are not clear about the reasons and evidence they are using (4)

A. Reasons fit together to support or deny a proposition

Rene Descartes (1596-1650, philosopher):

1. "Each problem that I solved became a rule, which served afterwards to solve other problems."
(Discourse on Method, 1637)

Rudolf Carnap (1891-1970, philosopher):

2. "Verification in science is not, however, of single statements but of the entire system or a sub-system of statements." (The Unity of Science, 1934)

B. Sensory experience is the source of all evidence

David Hume (1711-1776, philosopher):

3. "I never can catch myself at anytime without a perception, and never can observe anything but the perception." (A Treatise on Human Nature, 1739)

C. It's impossible to 100% prove or disprove a proposition (except for a few absolute facts)

Rene Descartes (1596-1650, philosopher):

4. "In order to seek truth, it is necessary once in the course of our life, to doubt, as far as possible, of all things." (Principles of Philosophy, 1644)

Antoine Lavoisier (1743-1794, chemist):

5. "The art of concluding from experience and observation consists in evaluating probabilities, in estimating if they are high or numerous enough to constitute proof." (Rapport des commissaires charges par le roi de l'examen du magnetism animal, 1784)

D. Controlled experiments are a good source of evidence

Rudolf Carnap (1891-1970, philosopher):

6. "One of the principal tasks of the logical analysis of a given proposition is to find out the method of verification for that proposition." (Philosophy and Logical Syntax, 1935)

Richard Feynman (1918-1988, physicist):

7. "...if you're doing an experiment, you should report everything that you think might make it invalid."
(Adapted from a 1974 Caltech commencement address)

Claude Bernard (1813-1878, physiologist):

8. "Indeed, proof that a given condition always precedes or accompanies a phenomenon does not warrant concluding with certainty that a given condition is the immediate cause of that phenomenon. It must still be still established that when this condition is removed the phenomenon will no longer appear."
(Introduction a l'Etude de la Medecine Experimental, 1865)

E. Disagreements are impossible to resolve when people are not clear about the reasons they are using

Francis Bacon (1561-1626, philosopher):

9. "Truth will sooner come out from error than from confusion." (Novum Organum, 1620)

Ludwig Wittgenstein (1889-1951, philosopher):

10. "To convince someone of the truth, it is not enough to state it, but rather one must find the path from error to truth." (Philosophical Occasions, 1993 posthumous)

I. A. Richards (1893-1979, literary critic):

11. "Rhetoric, I shall urge, should be a study of misunderstanding and its remedies." (Philosophy of Rhetoric, 1964)

Jane Goodall (1934-now, primatologist):

12. "Especially now when views are becoming more polarized, we must work to understand each other across political, religious and national boundaries." (Quoted in Verge Magazine, 2010)

5.4. Belief analysis

Belief analysis is a formal method to represent a belief. The purpose of this method is to display the structure of a belief in a transparent format. Here are the rules:

1. The belief should be stated using a single sentence
2. List reasons to support the belief (no more than 4-5 reasons)
3. Each reason should be stated with a short sentence
4. After each reason, list sub-reasons to support that reason (quotes or original writing)
5. Each sub-reason should be no longer than 2-3 sentences
6. There should be no more than 2-3 sub-reasons per reason

By clearly stating reasons and pieces of evidence, I believe it becomes easier to identify flaws in a belief. In this way, we can discover that some reasons are false or have a weak connection to the proposition. Overall, I believe this method can help opposing sides understand each other more clearly.

5.5. What is evidence?

What is evidence? Here is my definition:

Evidence is information that is relevant for determining the truth

I believe that evidence is the basis of all knowledge. It would be impossible to form a justified belief without relevant information. Evidence is the traction that allows a person to learn about reality.

5.6. What is proof?

What is proof? Here is my definition:

Proof is a evidence that establishes near absolute certainty

I believe there's not a clear line between proof and non-proof. For example, imagine that you see a person driving a public transit bus. Is this proof that the person is employed as a bus driver? I would regard this phenomena as proof even though I cannot be 100% certain that the person is an employed bus driver. There is a small chance that the person driving actually stole the bus. Regardless, we can consider this evidence as proof because it generates near absolute certainty.

5.7. What is a fact?

What is a fact? I have two definitions:

1. A fact is something known with absolute certainty
2. A fact is something known with certainty

Below is an explanation of each definition.

1. A fact is something known with absolute certainty

According to the first definition, anything that could be a hallucination or a dream is not a fact. For example, is it a fact that you're reading this sentence? No, because there's a chance you're actually asleep in a dream or that you're a brain in a vat experiencing a simulation.

Now imagine that you're actually a brain in a vat. What knowledge is still true in this hypothetical? Although this is probably not an exhaustive list, I can think of seven propositions that are still true in the brain in a vat hypothetical:

- I exist
- Consciousness exists

- Experience exists
- A sense exists
- A perception exists
- Reality exists
- Time exists

I believe that these seven propositions are necessary for any hallucination to happen. In this regard, even the most elaborate hallucination could not negate any of these propositions. For that reason, I believe that these seven propositions are absolute facts.

If the self didn't exist, there would be nobody to view the hallucination. If consciousness didn't exist, the hallucination wouldn't have been seen. If experience didn't exist, the hallucination wouldn't have been endured. If a sense didn't exist, there would be no way to access data about the hallucination. If a perception didn't exist, the hallucination wouldn't have been perceived. If reality didn't exist, there would be nothing. If time didn't exist, there would be no seconds to experience the hallucination.

I also believe that mathematical equations are not absolute facts. For example, take the question $8 + 6 = \underline{\quad}$. To demonstrate this question, you can take eight bananas and add six bananas and then count the total. The problem comes when you're counting. Even if you count the same total a thousand times in a row, there is still the chance that you miscounted every time. I believe this also applies if you imagine counting the bananas in your mind. Even if you used a calculator, the calculator could have messed up every time.

I also believe that logical conclusions are not absolute facts. Here is an example:

1. Every rabbit is purple
2. John is a rabbit
3. Therefore, John is purple

I do not regard this conclusion as an absolute fact. Imagine that you read the first premise and memorize it in your mind. Then you read the second premise while retaining your memory of the first premise. Now when you try to combine both premises, you might accidentally warp the memory of either premise leading to a mistake. Even if you perform this task hundreds of times, there is still a chance that the same mistake could be made every time.

2. A fact is something known with certainty

According to the second definition, a 'fact' is something known with certainty, but does not require absolute certainty. For example, if you see a book on the windowsill, it's a 'fact' that the book is on the windowsill. The only chance that the book isn't there, would be if it's a hallucination. But in our daily lives, we regard this as a 'fact'.

We can also learn facts about reality such as statistics, names and general information. According to this definition, a piece of information should have a high degree of certainty to be regarded as a 'fact'.

5.8. What is an axiom?

What is an axiom? Here is my definition:

An axiom is a principle believed to be certain

When a person reasons about something, sometimes a good starting point is to establish the axioms. In this regard, axioms build an unshakable foundation upon which a person can think about something. By making the axioms clear and established, I believe that a person can have a better chance of determining truth beyond the axioms.

5.9. What is science?

What is science? I have two definitions:

1. Science is a method of establishing knowledge through controlled experiments
2. Science is the study of any subject related to physics, chemistry or biology

Below is an explanation of each definition.

1. Science is a method of establishing knowledge through controlled experiments

According to the first definition, there is not a strict boundary between science and non-science because we can never be sure that every confounding variable has been controlled in an experiment. There is always a chance that an unseen variable could affect the experiment. In this regard, science is a subjective concept.

Is economics a science? I believe it depends on the specific study. I think the closest thing we have to controlled experiments in economics are quasi-experimental analyses which look at real world events that resemble controlled experiments. The problem with these studies is that there can be many confounding variables. For this reason, I believe it depends on each specific study for whether or not we can call it science.

2. Science is the study of any subject related to physics, chemistry or biology

The second definition of science has to do with physics, chemistry and biology. If you are studying a subject that involves any of these topics, I believe you are studying science. This definition also corresponds to science education in K-12 schools.

5.10. What is an experiment?

What is an experiment? Here is my definition:

An experiment is an event that potentially tests a hypothesis

When thinking about experiments, I divide experiments into two types: artificial and natural. An artificial experiment is a man-made procedure, while a natural experiment is a real-world event. Natural experiments are controversial because there will always be an abundance of confounding factors.

For example, measuring the impact of the American Recovery and Reinvestment Act of 2009 is not a clear experiment because there were many other variables affecting the economy at the time, making it difficult to isolate the impact of the stimulus package. In this regard, natural experiments require a higher level of analysis to assess the results.

Conversely, with artificial experiments it's much easier to isolate the impact of a treatment. With an artificial experiment you can have two identical groups and implement a different treatment to each group. Since both groups are theoretically identical, any difference in the results can be assumed to be caused by the treatment.

5.11. What is logic?

What is logic? Here is my definition:

Logic is the process of forming conclusions using objective reasons or premises

In our daily lives, I believe we subconsciously use logic all the time. Here is a basic logical argument:

1. All humans are mortal
2. Socrates is a human
3. Therefore, Socrates is mortal

Here is another example:

1. All door knobs are round
2. X is a door knob

3. X is round

I believe we use this line of thinking constantly. Throughout our lives, we create an extensive list of beliefs about reality. We use this web of beliefs to function and navigate through life. This three-line form is so ubiquitous that we are largely unaware of it. I believe this method is the most basic form of reason.

5.12. What is intuition?

What is intuition? Here is my definition:

Intuition is the process of forming beliefs based on unclear reasons

I believe that intuition comes from the subconscious mind. In our daily lives we absorb a large amount of data, but we're only aware of a small portion. Most of this data is stored in our subconscious memory. I believe that sometimes our subconscious memory speaks to us through intuition. This occurs when we form beliefs based on feelings and unclear reasons.

5.13. What is memory?

What is memory? Here is my definition:

Memory is the faculty that enables an entity to store and retrieve information and data

I like to think of memory and the subconscious as opposite sides on a continuum. Memory is the established information while the subconscious is non-established information. There is not a strict line between memory and the subconscious. For example, as time passes, knowledge about past events becomes less clear and we might remember fewer details. This transition out of memory is very gradual and there is not a clear moment when a piece of information becomes subconscious.

I believe we establish information in two main ways: in our mind and in written form. Using our mind (via memory), we can access and store a large amount of information and data. Similar to taking an object off of a shelf, we can look into our mind and grab a piece of information to help us operate in reality. The other method of storing information is to write it down in physical reality. This includes books, pictures, handwritten notes and computer files. In this regard, computers also have a memory.

Although we can't describe every sense we encounter, I believe that the mere attempt to put these things into words helps establish them in our memory. Language makes our thoughts clear and without words we are living in a whirlwind of senses.

5.14. What is statistics?

What is statistics? Here is my definition:

Statistics is the study of analyzing numerical data

I believe that statistics can be a useful tool for testing hypotheses and discovering probabilities. Often in statistics, a researcher will study data from a representative sample with the purpose of inferring a conclusion about the whole population. It's important to have a good representative sample because some samples can misrepresent the entire population.

Another issue has to do with the relationship between correlation and causation. Just because two variables are correlated does not mean that one variable causes the other. In order to draw the conclusion that one variable causes the other, further research might be needed such as controlling confounding variables and examining the causal mechanism.

5.15. What is analysis?

What is analysis? Here is my definition:

Analysis is a detailed examination of something with the purpose of drawing conclusions

I believe that analysis is not limited to a single method or set of rules. There are many different ways that a person can perform a detailed examination. Examples of analysis include writing down observations, constructing creative experiments, examining statistical data, thinking about various pieces of evidence, looking at graphs or determining the significance of something.

5.16. What is a conclusion?

What is a conclusion? Here is my definition:

A conclusion is a representation reached after thinking

Sometimes in life we become confused about certain things. In my experience, I will ruminate through related thoughts over and over until I reach a conclusion. This process is similar to pouring dirt into a glass of water, stirring the contents and waiting for the substance to settle. Once the substance has settled

to equilibrium, I regard this as the conclusion. I always appreciate the conclusion because it feels as though my thoughts have become united into a coherent whole.

6. Understanding

6.1. What is understanding?

What is understanding? I have two definitions:

1. Understanding is the condition of knowing the explanation of something
2. Understanding is the condition of having competent knowledge in something

Below is an explanation of each definition.

1. Understanding is the condition of knowing the explanation of something

The first meaning of understanding has to do with explanation. For example, to have understanding of a cloud is to know the reasons why it floats, why it's white, what it's made out of, etc. A caveman who sees a cloud will not understand this phenomena because they will not have an explanation for what they are witnessing.

Another example, to have understanding of Chinese history means to have a clear interpretation of events that have occurred in China. A person with deep understanding would know many details about Chinese history and how these details relate to each other. If somebody asked them for an explanation of a historical event in China, they could provide a clear description of the event. By providing a good explanation, this person would be demonstrating their understanding.

2. Understanding is the condition of having competent knowledge in something

The second meaning has to do with competence. For example, to understand the Spanish language means to be competent at using Spanish. This has nothing to do with an explanation of the Spanish language. Here is another example: to understand the rules of baseball is to know what is going on in a baseball game. Somebody who doesn't understand the rules of baseball will be confused watching baseball. This has nothing to do with the explanation of why baseball rules were invented a certain way.

6.2. Quotes and the organization of thoughts

I believe that many of our thoughts can be represented in quote form. While some thoughts can be expressed in a single sentence, other thoughts are more complex and require an entire paragraph.

In my opinion, converting a thought into a quote is one of the most important activities an intellectual can engage in. Thoughts existing in the mind are hidden and it's the duty of an intellectual to create physical representations of these thoughts.

I like to think that every quote is a unique pebble. Every quote has its own unique properties and dynamics. Although a quote might have a similar meaning to another quote, it will still have a unique nature in the way the words are utilized. Also similar to pebbles, quotes can be very beautiful.

I enjoy collecting quotes and organizing them into clear structures. To me, structured quotes are easier to understand than continuous prose. Even when I write normally, I try to keep my paragraphs short and clear. Either way, I'm trying to organize thoughts into coherent structures.

6.3. What is a principle?

What is a principle? Here is my definition:

A principle is a proposition that contributes to the structure of a topic

I believe that we structure our knowledge around principles. Principles constitute the outline of our knowledge. We can add to this list of principles and create dynamic systems. In this regard, principles help organize our thoughts into coherent structures.

6.4. What is a fundamental?

What is a fundamental?

A fundamental is a core principle

I believe it's important to establish the most important principles behind a topic. This can be difficult because principles can overlap and have complex interrelations. Although a topic may appear inherently complicated, I believe there are usually a few underlying fundamentals that govern the whole system. Similar to untying a knot, fundamentals can be unearthed and organized into clear structures.

6.5. What is a system?

What is a system? Here is my definition:

A system is a set of interrelated things that form a unified whole

I believe that reality is full of hidden systems and intellectuals should strive to understand these systems and make them clear. One example is the circulatory system of blood in the human body which was described in detail by William Harvey. Another important system is the structure of an atom which is studied by physicists. In my opinion, one of the most mysterious systems is the human brain.

7. Phenomena

7.1. What is a phenomenon?

What is a phenomenon? Here is my definition:

A phenomenon is something that can be perceived

I believe that every detail of experience is a phenomenon. Everything you can notice is a phenomenon. This includes every event, attribute, object, piece of information, thought, sense and anything else that can be observed.

What is the difference between a phenomenon and perception? I believe that a perception is the sense itself, while a phenomenon is the thing being sensed. For example, imagine that somebody watches a tree fall over. The phenomenon is the tree falling, while the perception is the sense occurring in the mind of the viewer.

7.2. What is phenomenology?

What is phenomenology? Here is my definition:

Phenomenology is the study of immediate perception

I believe that phenomenology is one of the most interesting topics to study. This occurs whenever you take one of your senses and examine the sense itself. You can do this for any sense: feel, taste, sight, thought, smell, hearing, etc. All you have to do is observe the intricacies of the sense, especially the small details you never notice.

7.3. Fundamentals of phenomenology

This is a collection of some quotes about phenomenology. There are 23 quotes divided into 9 sections.

- A. Phenomenology is the study of immediate perception (3)
- B. All knowledge begins with phenomenology (2)
- C. Direct perception in the present moment is fact (1)
- D. Memory is a bookcase that we can grab knowledge from (3)
- E. The six main senses are vision, hearing, touch, taste, smell and thought (3)
- F. Most thoughts mimic the other five senses (2)
- G. Reality is full of details (3)
- H. Reality is full of potential concepts (3)
- I. The feeling of good is mysterious (3)

A. Phenomenology is the study of immediate perception

Charles Sanders Peirce (1839-1914, philosopher):

- 1. "That artist's observational power is what is most wanted in the study of phenomenology." (Pragmatism and Pragmaticism, 1903)

Edmund Husserl (1859-1938, philosopher):

- 2. "To begin with, we put the proposition: pure phenomenology is the science of pure consciousness." (Goodreads.com)

Edmund Husserl (1859-1938, philosopher):

- 3. "A new fundamental science, pure phenomenology, has developed within philosophy: this is a science of a thoroughly new type and endless scope. It is inferior in methodological rigor to none of the modern sciences." (Pure Phenomenology, 1917)

B. All knowledge begins with phenomenology

William Stanley Jevons (1835-1882, economist):

- 4. "In a certain sense all knowledge is inductive. We can only learn the laws and relations of things in nature by observing those things." (The Principles of Science, 1874)

Simone Weil (1909-1943, philosopher):

- 5. "Although people seem to be unaware of it today, the development of the faculty of attention forms the real object and almost the sole interest of studies." (Reflections on the Right Use of School Studies with a View to the Love of God, 1942)

C. Direct perception in the present moment is fact

John Stuart Mill (1806-1873, economist):

6. "Whatever is known to us by consciousness, is known beyond possibility of question. What one sees or feels, whether bodily or mentally, one cannot but be sure that one sees or feels." (A System of Logic, 1843)

D. Memory is a bookcase that we can grab knowledge from

Philip Roth (1933-2018, novelist):

7. "Memories of the past are not memories of facts but memories of your imaginings of the facts." (The Facts: A Novelist's Autobiography, 1988)

Francis Buller (1746-1800, judge):

8. "Some instances of strength of memory are very surprising." (Coleman v. Wathen, 1793)

Henri Bergson (1859-1941, philosopher)

9. "Without this survival of the past into the present there would be no duration, but only instantaneity." (An Introduction to Metaphysics, 1903)

E. The six main senses are vision, hearing, touch, taste, smell and thought

Leonardo da Vinci (1452-1519, artist):

10. "The eye, which is called the window of the soul, is the principal means by which the central sense can most completely and abundantly appreciate the infinite works of nature; and the ear is the second, which acquires dignity by hearing of the things the eye has seen." (Quoted by The Notebooks of Leonardo da Vinci by Rudolf Flesch)

Michel Foucault (1926-1984, philosopher):

11. "The painter is turning his eyes towards us only in so far as we happen to occupy the same position as his subject. We, the spectators, are an additional factor." (The Order of Things: An Archaeology of the Human Sciences, 1970)

Martin Heidegger (1889-1976, philosopher):

12. "We ourselves are the entities to be analyzed." (Being and Time, 1927)

F. Most thoughts mimic the other five senses

Robert Andrew Wilson, Frank Keil:

13. "However, the central role of imagery in theories of mental activity was undermined when Kulpe, in 1904, pointed out that some thoughts are not accompanied by imagery..." (The MIT Encyclopedia of Cognitive Sciences, 2001)

Temple Grandin (1947-now, professor):

14. "To understand animal thinking you've got to get away from a language. See my mind works like Google for images. You put in a key word; it brings up pictures. See language for me narrates the pictures in my mind." (NPR: A Conversation with Temple Grandin, 2006)

G. Reality is full of details

Baruch Spinoza (1632-1677, philosopher):

15. "The more reality or being a thing has, the greater number of its attributes." (Ethics, 1677)

Laurence Sterne (1713-1768, novelist):

16. "Digressions, incontestably, are the sunshine; and they are the life, the soul of reading; take them out of this book for instance, you might as well take the book along with them." (The Life and Opinions of Tristram Shandy, Gentlemen)

George Henry Lewes (1817-1878, literary critic):

17. "...it is in the selection of the characteristic details that the artistic power is manifested." (The Principles of Success in Literature, 1865)

H. Reality if full of potential concepts

Ferdinand de Saussure (1857-1913, linguist):

18. "Without language, thought is a vague, uncharted nebula. There are not pre-existing ideas, and nothing is distinct before the appearance of language." (Cours de Linguistique Generale, 1916)

Albert Einstein (1879-1955, physicist):

19. "By means of such concepts and mental relations between them, we are able to orient ourselves in the labyrinth of sense impressions." (Physics and Reality, 1936)

Peter Strawson (1919-2006, philosopher):

20. "Part of my aim is to exhibit some general and structural features of the conceptual scheme in terms of which we think about particular things." (Individuals, 1959)

I. The feeling of good is mysterious

Jacques Lacan (1901-1981, psychologist):

21. "Desire, a function central to all human experience, is the desire for nothing nameable. And at the same time this desire lies at the origin of every variety of animation." (Goodreads.com)

G. E. Moore (1873-1958, philosopher):

22. "If I am asked, 'What is good?' my answer is that good is good, and that is the end of the matter. Or if I am asked, 'How is that to be defined?' my answer is that it cannot be defined, and that is all I have to say about it." (Principia Ethica, 1903)

23. Simone Weil (1909-1943, philosopher):

"There is a reality outside the world, that is to say, outside space and time, outside man's mental universe, outside any sphere whatsoever that is accessible to human faculties. Corresponding to this reality, at the centre of the human heart, is the longing for an absolute good, a longing which is always there and is never appeased by any object in this world." (Draft for a Statement of Human Obligation, 1943)

7.4. What is experience?

What is experience? Here is my definition:

Experience is the totality of past and present sense data

I believe that experience is the only thing we know in life. It's impossible to perceive anything without it being an experience. In this regard, I also believe that our inner thoughts are an experience. For example, imagine that while working in an office, you walk over to the water fountain, get some water and return to your desk. Once you are back at your desk, you can reflect on the individual thoughts going through your head during your trip to the water fountain. This is why I believe we experience our own thoughts.

7.5. What is a sense?

What is a sense? Here is my definition:

A sense is a faculty that retrieves data

I believe that senses are the only way we can learn about reality. Although we are unaware of most data we receive on a daily basis, everything we know about reality was originally received through a sense. I believe this includes sensing our thoughts and feelings.

I also believe that machines can have senses. For example, light bulbs can have motion sensors that turn on the light bulb when somebody enters the room. I believe this qualifies as a sense. In this regard, unconscious objects can have senses.

7.6. What is a perception?

What is a perception? Here is my definition:

A perception is a conscious sense datum

In our daily lives, we are exposed to a large amount of sense data. Derived from our immediate environment, our senses are always taking in new data. Of course, not every piece of sense data receives conscious attention. In this regard, we are unaware of most of the data we encounter. The moment that a datum captures our attention, it becomes a perception.

7.7. What is data?

What is data? Here is my definition:

Data is rudimentary information

I believe that data is the root source of all knowledge. Everything we know about reality was originally received as data through a sense. Data is the most basic material we use to construct our beliefs about reality.

7.8. What is information?

What is information? Here is my definition:

Information is something that educates

I believe that the fundamental purpose of information is to educate. Information must have the ability to teach something. For example, imagine that you see a kiosk with some language and maps displayed. This is information because you can learn something from the kiosk.

I also believe that information is not necessarily true. There is a large amount of false information floating around in the universe. As long as the material has the potential to teach something true or not, I believe it qualifies as information.

7.9. What is a pattern?

What is a pattern? Here is my definition:

A pattern is something that recurs consistently

I believe that reality is filled with many patterns. Some patterns are observed while others are unnoticed. I also believe that a pattern doesn't need to be observed to exist. As human beings, we automatically search for consistencies to help us understand reality. Knowing patterns is essential for many diverse applications.

I believe that pattern recognition is one of the major goals of knowledge. For example, the equation, $E=MC^2$ is a pattern that was first discovered by Albert Einstein. Another example is the phenomenon that it takes about 365 days for the Earth to rotate around the sun. This pattern occurs without fail otherwise the seasons on Earth would be distorted.

7.10. What is a cause?

What is a cause? Here is my definition:

A cause is something that gives rise to something else

I believe that causation is an observable concept. Causation is a relationship between two separate phenomena where one phenomenon gives rise to the other. For example, if you take a shower, it will cause you to be clean. In this regard, you can observe the causal relationship between showering and being clean.

I also believe that causation is a subjective concept. There's not a clear line between a cause and a non-cause. For example, imagine a pineapple sitting on a chair. What caused the pineapple to be sitting there? Because I was using the pineapple to create a still life painting. Why was I creating a painting? Because there was a painting contest. Why was I in the painting contest? Because my teacher encouraged me to join. This process can turn into a never ending regression of causes. In this regard, it's subjective whether or not something is a cause.

I believe that a constructive way to view causation is to make a list of causes that are most relevant. Making a list of the most important causes will lead to greater understanding of the particular instance. Deciding which causes are most important is subjective, but I believe it's a useful way to think about causation.

7.11. What is a thing?

What is a thing? Here is my definition:

A thing is a physical object, event, thought, attribute or transcendental entity

I believe that 'thing' is one of the most expansive concepts. If you look around your room, you will see nothing but things. Everything that has physical matter is a thing. Also every attribute is a thing regardless of how abstract it is. I also consider mental objects as things. For example, if you imagine eating ice cream, the imagination in your head is a thing even though it's not a physical object.

7.12. What is something?

What is something? Here is my definition:

Something is an unspecified object, event, thought, attribute or transcendental entity

I believe that the difference between 'something' and 'thing' depends on whether or not there is a clear reference point. For example, if you see a mushroom in the grass, you might point at it and say, "Look at that thing!" but you wouldn't say, "Look at that something!" In this situation, it would be incorrect to say 'something' because the mushroom is clearly referenced.

On the contrary, if you want to refer to something that is vague or unspecified, you might say, "Something is wrong with the painting." In this situation, you don't know what exactly is wrong but you believe there's a thing that is wrong.

7.13. What is an entity?

What is an entity?

An entity is something that has a distinct and independent existence

I believe that distinctness is the core essence of the word 'entity'. For example, if there was a golf tournament with 500 participants, each participant would be its own entity. This is because every participant's score would be independent from every other participant's score.

7.14. What is an object?

What is an object? I have two definitions:

1. An object is a physical entity
2. An object is something that can be perceived

Below is an explanation of each definition.

1. An object is a physical entity

In our daily lives we encounter many objects. Anything that takes up physical space is an object. According to this interpretation, neurons in your brain are also objects.

2. An object is something that can be perceived

I believe that the second definition of 'object' is synonymous with the word 'phenomena'. An object is something that can occupy your awareness. In this regard, an object can be an attribute such as 'tangled' or 'dry', but it can also be a noun such as 'chair' or 'airplane'.

7.15. What is an attribute?

What is an attribute? Here is my definition:

An attribute is an identifiable part of something

I believe that anything that can be identified as being part of something is an attribute. For example, if somebody asked you for a list of attributes about your car, you would tell them a few identifiable things about the car. You might tell them that your car has three wheels or that it can go over 200 kilometers per hour. Both of these attributes are identifiable aspects of the car.

7.16. What is a detail?

What is a detail? Here is my definition:

A detail is information about something

What's the difference between a detail and a piece of information? I believe these words have a perfect overlap but they have a slightly different emphasis. The emphasis of a detail is to describe, while the emphasis of information is to provide education. Every detail is a piece of information; every piece of information is a detail.

7.17. What is an aspect?

What is an aspect? Here is my definition:

An aspect is a specific attribute

I believe that an aspect is an individual attribute that exists among a group of other attributes. The defining feature of an aspect is its coexistence in relation to other attributes in the same thing. In this regard, viewing something from an alternative perspective might reveal different aspects.

7.18. What is a characteristic?

What is a characteristic? Here is my definition:

A characteristic is a typical attribute

I believe that a characteristic is a quality that is often true. For example, if you say, "The employee is normally punctual" then the word 'punctual' is a characteristic because it describes a typical quality. Although there might be instances where the employee is not punctual, the employee will usually be on time.

Another example, if you say, "San Diego normally has warm weather" the word 'warm' is a characteristic because it's true most of the time. Of course there are times when San Diego has cold weather, but this doesn't remove the underlying characteristic.

7.19. What is a property?

What is a property? Here is my definition:

A property is a fundamental attribute

I believe that properties are the most fundamental type of attribute. When I think of properties, I often think of chemical elements. Every chemical element has its own fundamental attributes which are also called 'properties'. For example, helium has the property of a low boiling point. This is a property because having a low boiling point is fundamental to helium.

7.20. What is a trait?

What is a trait? Here is my definition:

A trait is an attribute that does not consistently exist among members of the same group

I believe that traits are what make individuals unique. For example, brown eyes are a trait because eye color varies from person to person. What makes something a trait is the existence of members in the same group without the attribute.

7.21. What is a condition?

What is a condition? Here is my definition:

A condition is a non-permanent attribute

I believe that a condition is a state of existence and is not permanent. For example 'frozen' is a condition of an object. The word 'frozen' is a condition because it describes an attribute of an object even though it's not permanent. It's conceivable that a frozen object could someday not be frozen.

7.22. What is a quality?

What is a quality?

A quality is a non-quantitative attribute

I believe that qualities cannot be quantified. For example, if you look at grass and notice that it's dry, you cannot describe this attribute with a number. Instead you need to use a word that represents the concept 'dry'. Since there are many attributes in reality that do not involve numbers, we have created words to represent these concepts.