TOK Prompt: “Facts are needed to establish theories but theoriesare needed to make sense of facts.” Discuss this statement with reference to two areas of knowledge.

How does one come up with a theory? How does one come up with a fact? In order to

answer each question, one must know what each term means. A theory is an explanation based on scientific studies and/or general examples. A fact is something that is confirmed to be indisputably the truth. From this, we can see that facts are the same things as scientific studies because they are things that are proven to be true. In this case, we can deduce that facts are the components of scientific theories, thus confirming that we can establish theories by using facts. Although some theories are generally built on facts inductively, facts are not needed to construct a theory because not all theories are based on scientific studies. Theories can also be based on general examples that aren’t scientifically proven to be correct, which means theories can also be an account of a phenomenon that may or may not be true. In other words, all facts make up theories, but not all theories are made up of facts. Therefore, facts are a required factor in the creation of theories, so it is true that they are needed to establish theories. However, theories are not necessary in order to rationalize facts because one can make sense of facts without knowing about the theory that goes along with it.

The concept of Inductivism from the Natural Sciences chapter explains that prior to producing a theory, scientists has to go through the scientific method. This systematic procedure consists of five key steps in this order: observation, hypothesis, experiment, law, and theory. According to this traditional picture of the scientific method, we can see that observations lead to the hypothesis, which then eventually forms a theory. Similarly, facts can be viewed as observations and other key steps from the scientific method that are needed to establish theories. For example, one spring afternoon, my mother observed that the corns from our garden are not growing properly. She came up with the hypothesis that it was because we had been lacking rain the past seasons. With this in mind, my mom experimented with something new the following season, which was to test out how much water corn crops need in order to grow sufficiently. A few months later, she concluded that the corn she just planted had in fact grown, due to the increase of water. These observations and experiments are the facts that made up her theory that corn are high water-consuming plants.

In science, we are taught about many subjects that range from ancient times to modern times. These topics may include several theories that scientists had developed during their process to discover current informations. For example, in Charles Darwin’s theory of Evolution, he stated that all life is related and has descended from a common ancestor. This is a widely held notion even until this day because his theory of evolution had supporting facts from his consistent experiments and results. In addition, other scientists and biologists also confirmed this theory with their own personal researches and scientific disciplines. Evidence such as fossils and similarities between related living organisms guided Darwin in his testimony process, such as when he experimented with black bears to find out how natural selection could cause a land mammal to turn into a whale. The results Darwin gathered from this experiment, along with other experiments, helped him develop the evolution theory. With that being said, we can conclude that facts are the building blocks of theories because Darwin’s theory of evolution included several trials of relevant experiments with multiple supporting facts.

A counterclaim to this is that facts are not needed to establish theories when the theory is a set of principles on which there is no practice of an activity. In other words, a theory can also be an individual’s personal opinion, which may or may not be composed of legitimate supporting ideas. For example, one time I came up with the theory that dark-feathered birds fly higher than light-feathered birds. This idea was not supported by any evidence, I simply just assumed it and stuck to it. Therefore, there were no contribution of facts in the creation of my theory because it was just an opinion that is yet to be proven and tested. The concept of Inductivism, explained in the TOK textbook, allows us to see that facts are an important part of the establishment of scientific theories because observing facts will lead to hypotheses, which leads to experiments, then develops laws and concludes with a theories. However, inductivism doesn’t apply to all types of theories. With that being said, non-scientific theories are ideas used to account for a situation or justify a course of action. Therefore, they are not composed of facts since they are just ideas that are yet to be proven. In summary, facts are a requirement of the production of scientific theories, but not needed to construct all theories because there are many types of them.

In the chapter Math, from the TOK textbook, the concept of Theorems connects to the prompt and supports my thesis which includes the Way of Knowing, Deductive Reasoning, to support its point. Deductive reasoning is a logical process in which a conclusion is based on the concordance of multiple premises. This relates to the prompt because the conclusion is the same thing as the theories and the premises represent the facts. Math can relate to this because in order to come up with a function, there must be problems in the first place. For example, at the beginning of each unit in my math class, my teacher gives us several math problems without teaching us how to do them. After everyone attempted to find a solution, he announces a way to solve the problem, which usually differs from how the students solved the problem and usually involves a short cut or a formula. In this case, math problems are not necessarily like facts because they are needed to establish more general topics such as formulas. On the same note, math formulas are not needed to make sense of math problems because almost every student in the class solved and understood the problem prior to the teacher teaching us the formula. In other words, an individual can use their own knowledge to figure out how to find a solution to the math problems without using a specific technique and formula to guide them in order to make sense of the problem. Similarly, an individual can make sense of facts without the need of theories because we can use our intuition to help us understand them. This claim is supported by the ways of knowing, Intuition, where it explains that an individual has the ability to instantly know certain information.

A counterclaim to this would be that not everyone has the same kind of mindset. This prevents certain people from intuitively making sense of things, while others have that advantage. With that being said, sometimes it is necessary for theories to be included for certain people to be able to make sense of facts because not everyone is privileged with the same knowledge. In other words, common sense isn’t so common sometimes since not everyone is capable of understanding certain things so accurately and rapidly. For example, one time my cousin and I were scrolling through social media and we saw a picture. I started laughing immediately, but my cousin on the other hand, just sat next to her with a straight face. Later, I explained to her that the picture had a quote from a tv show, which was why it was funny. According to this situation, my cousin needed me to provide her with some background information in order for her to fully comprehend the meaning behind the photo. This shows to prove that not everyone will understand everything immediately without a little guidance. In comparison to the prompt, others can say that theories are indeed needed to make sense of facts because they act as the background informations that help provide better knowledge for an individual in order for them to determine the meaning of the facts that goes along with it.

The German philosopher, Immanuel Kant, stated that “Experience without theory is blind, but theory without experience is mere intellectual play.” The term “blind” in this quote means that it is unclear and incomprehensible. In other words, experiences cannot be understood without the presence of a theory, which contradicts with my claim that theories are not needed to make sense of facts. Others may agree with Kant’s quote because it is true to some extent since facts and theories have such a close relationship. Due to the fact that development in facts leads to devel­opment in theory, many people can conclude that this phrase can be vice versa, meaning that developments in theories can also lead to developments in facts. People may argue that if an individual has the opportunity to know about both the fact and the theory, it will give them a better understand of both the fact and the theory because they share such a close relationship. I agree that this can be true, however, it only applies to really complicated and difficult situations. This means that theories are not required or needed to make sense of facts since it doesn’t necessarily inform an individual about what they’re seeking to know, but it only adds onto what they already know.

In conclusion, facts are needed to establish theories because they are the major components of scientific theories. Keep in mind that the definition of theories does not only mean that they are true because theories can also just be an individual’s personal opinion about a certain situation. Theories are not required in order to make sense of facts because one can uncover what the fact’s message is about without the guidance of a theory. When we think about a theory, we assume that they are general topics. With that being said, these general topics are constructed from several specific topics. These specific topics may not be facts, but they can still establish theories, just not scientific theories. With the help of our intuition, we are capable of knowing information almost instantly. With that being said, we do not necessarily need the presence of a theory in order to help us make sense of the facts.