

<p>Deerfield Beach High School I.B. Theory of Knowledge Application Assessment #2 <i>Natural Sciences and Mathematics as Areas of Knowledge</i></p>
--

DIRECTIONS

CONTEXT: In this set of units, we have discussed the broader contributions of natural sciences and mathematics to our knowledge and understanding of the world around us. We have considered their nature, limitations, methods, and applications. Additionally, we have re-explored the concept of truth, certainty, facts and informed opinions. These questions will require you to consider what you learned in these discussions and apply these ideas in your responses.

PREPARATION & RESOURCES:

Objective:

To review key aspects of the knowledge framework and to consider some essential knowledge questions in mathematics and the natural sciences.

Resources:

The *Kognity* online TOK textbook is an essential reference for Part 1 of this assignment. For Part 2, where appropriate, any of the readings and resources in the natural sciences and mathematics units should be utilized to respond to these questions. These are a good source of examples to justify your responses. All the readings and video resources that were required and suggested are all available on Canvas.

Parameters & Requirements:

PART 1 [Completed via *Kognity*]: Complete the *Kognity* Natural Sciences & Math Question Assignment online. There will be 5 questions focused on natural sciences and 5 questions focused on mathematics. (10 points total)

PART 2 [Complete via Canvas]: Read carefully the following pair of questions, and then answer each of the questions with a well-argued and supported response. Such a response should include evidence of a personal connection, careful consideration of the explicit and implicit aspects of the question, and clear examples to support your claims. Please refer to the learning scale for this assignment, and respond to these questions in the designated Canvas assignment. (10 points total)

1. **Mathematics vs. the other Areas of Knowledge:** How is the knowledge that math offers different from other areas of knowledge and why? Consider carefully the knowledge framework in your response. (5 pts for this question)

2. **Morality & Ethics in the Sciences:** In 2018, a Chinese scientist claimed he successfully altered the DNA of twin girls born earlier this month to try to make them resistant to infection with the AIDS virus. Mainstream scientists have condemned the experiment, and universities and government groups are investigating. How does this real-life situation represent our considerations regarding morality and ethics in the field of natural sciences and how the scientific community functions to create and share knowledge? (5 pts for this question)

Background Source References for #2:

CBS News Miami: <https://www.youtube.com/watch?v=j4sepzbAG0c>

Sciencemag.org: <https://www.sciencemag.org/news/2019/08/untold-story-circle-trust-behind-world-s-first-gene-edited-babies>

FORMAT: Part 1 - Answer the questions using your *Kognity* account.

Part 2 - Your question responses must be typed into Canvas via your account. Each question must be numbered to show clear organization. There is no minimum or maximum word limit, so there is no guideline for length here; please answer the questions or explain yourself in the responses as fully and as thoroughly as you can.

Failure to comply with these formatting specifications and requirements will result in an immediate 2 point deduction before scoring commences.

Deductions for late assignments will amount to 20% deduction per day (per part) you are delinquent. No assignments will be accepted for late scoring beyond 4 days of the assignment due date. Please submit work on time.

Assessment Application #2: Learning Scale for Task

<p><u>Standard:</u> LAFS.1112.L.3.6 - Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.</p>	
<p><i>Based on Depth of Knowledge (DOK) Levels</i></p>	
<p>DOK Level 4</p> <p>Score: 10</p>	<p>In addition to Score 3, in-depth inferences and applications that go beyond instruction are demonstrated by the student in a well-developed, critical response.</p> <p>The student's response includes evidence of a personal connection and identifies key knowledge questions in which the student describes and applies ideas/concepts within the context and therefore demonstrates mastery.</p>
<p>DOK *Level 3*</p> <p>Score: 8-9</p>	<p>In addition to Score 2, the student identifies and applies specific terminology noted at Score 2.</p> <p>The student research clearly addresses the category tasks and he/she responds to the questions in the task with a well-argued and supported response. The response includes evidence of a personal connection, demonstrates a careful consideration of the explicit and some implicit aspects of the question, and utilizes supporting evidence to support the student's claims.</p>
<p>DOK Level 2</p> <p>Score: 7</p>	<p>The student recognizes and describes specific terminology in math and the sciences such as proof, axioms, theorems, scientific method, facts, theories, hypotheses, inductive vs. inductive reasoning, and experimentation, as well as perspectives, truth, knowledge claims and questions.</p> <p>* The student's consideration is adequate, but not thorough. No major errors or omissions regarding the simpler details of the above noted ideas/concepts, but major errors or omissions regarding the more complex ideas/concepts.</p>
<p>DOK Level 1</p> <p>Score: 6</p>	<p>With help, a partial understanding of some of the simpler details and implications of the more complex ideas/concepts being assessed in the question or task. The student's consideration and research may not be completely adequate for the task.</p>
<p>DOK Level 0</p> <p>Score: 1-5</p>	<p>Even with help, little to no understanding or skill demonstrated; or student did not respond to this question/task; or student submitted the assignment beyond the 4-day late grace period.</p>