Literacy Design Collaborative

Literacy Context:

SCIENCE

Writing Mode:

ARGUMENTATION

ANCHOR PAPERS

FOR

MIXED MODULE

Middle School

(Grades 6 – 8)

Information Sheet

Module Title:
Should helmets be required?

Module Description (overview):

Although many adolescents participate in recreational activities such as skateboarding or bike riding; many of them do not wear helmets. The laws of Pennsylvania do not require children over the age of 12 to wear helmets or protective gear while riding a bike, however many children are injured because of accidents, falls, or juvenile behaviors while riding. During this module, the students will read texts on Newton's Laws of Motion, bodily injury, and current state laws on helmet requirements and write an argumentative letter deciding whether or not helmets should be required for adolescents during recreational activities.

Template Task (include number, type, level)	Teaching Task
Task 2 Template (Argumentative) [Insert Essential Question] After reading _____(informational texts) write _____,that addresses the question and supports your position with evidence from the text. L2 Be sure to acknowledge competing views. L3 Give examples from everyday life to illustrate and clarify your position. All levels include a works cited.	Should adolescents be required to wear helmets during recreational activities such as bike riding and skateboarding? After reading informational texts on the Laws of Motion, bodily injury, and current state laws on helmet requirements, write a letter to the your state representative that addresses the question and supports your position with evidence from the text(s). L2: Be sure to acknowledge competing views. L3: Give examples from everyday life to illustrate and clarify your position. All levels include a works cited.

Grade(s)/Level: 6

Discipline: Science

Course: Force and Motion

Author(s):

Contact Information:

E. Materials, references and supports: List the materials you will need and students will use. Provide citations.

For Students:

Article 1: Concussions
http://kidshealth.org/teen/safety/first_aid/concussions.html

Article 2: Head and spine trauma from ATV accidents cost $3.24 billion annually
http://esciencenews.com/articles/2010/07/06/head.and.spine.trauma.atv.accidents.cost.3.24.billion.annually

Article 3: Pennsylvania's Bicycle Helmet Law
http://nova.pasenategop.com/brochures/bike-**helmet**-adult.pdf

Article 4: Head injuries increase after motorcycle helmet law repeal
http://esciencenews.com/articles/2008/06/12/head.injuries.increase.after.motorcycle.helmet.law.repeal

For Teachers:

Center of Disease Control: Traumatic Brain Injury in the United States
www.cdc.gov/TraumaticBrainInjury

Literacy Design Collaborative Anchor Paper Annotation Form

Content Area: ☒ Science ☐ History-Social Studies ☐ English Language Arts

Mode: ☒ Argumentation ☐ Informational/Explanatory

Grade Level: 6

Template Task #: 2

Module Title: **Should helmets be required?**

Teaching Task: **Should adolescents be required to wear helmets during recreational activities such as bike riding and skateboarding? After reading informational texts on the Laws of Motion, bodily injury, and current state laws on helmet requirements, write a letter to your state representative that addresses the question and supports your position with evidence from the text(s).**

Achievement Level: **MS-SCI.A2.Sample 24**

Dimension	Score	Explanation of the Score / Evidence
Focus	1.5	The introduction attempts to engage by presenting a stark fact. While the letter is generally about helmet use, the focus shifts from age ranges of children to Laws to lowering medical costs, with little relevant connection between ideas. The letter is a scattering of basic information and lacks focus.
Reading/Research	1.5	A few details from reading materials are referenced, but lacking in development to support the purpose. Two body paragraphs minimally address laws of motion.
Controlling Idea	1.5	Medical facts are cited but seem more of a list of negatives than an explanation for helmet use. Random statistics could support the purpose, but they are limited or altogether missing (as in the last paragraph: "Helmets help lower medical cost").
Development	1	The student does not understand what "long-term health problems are," and lack of support about the relationship between health issues and helmet use is absent. The third paragraph mentions "the study" but does not identify the research; the last, incomplete sentence confuses the reader. In a brief argument, several ideas are repeated, such as "the helmet takes the impact."
Organization	1	Paragraphs are present but the overall ideas are disjointed. The argument for helmets is weak due to limited transitions. Information is partly relevant, but lacking connections even within paragraphs (see conclusion.)
Conventions	1.5	There are many errors. "While head injuries due to accidents occur in all age groups, children and youths are disproportionately affect . . ." There is a general imbalance of engaging and imprecise language, making it difficult to tell when the student is citing or interpreting. "This is higher than children 10-14 years old" is confusing. The last sentence shows little control of internal punctuation (comma and colon), capitalization, and structure. Other missing commas ("Long-term health problems include short-term memory loss, inability to concentrate to coma and death.") Spelling is generally correct. Generic language is not convincing.
Content Understanding	1.5	Two of Newton's Laws are noted and briefly discussed, but the information is only weakly tied in with the articles on head injury.

This student would benefit from feedback, discussion and/or instruction in the following areas:

- Integrating research with personal opinion
- Choosing an overall claim and developing individual ideas in each paragraph
- Mechanics, especially punctuation and grammar
- Benefits of editing and review

350 North 8th St

May 16, 2011

e Fc
l Building
street

Dear Mr. F:

Did you know that 189,089 (15-19 years old) adolescents were treated in the hospital for head injury due to not wearing helmets? This is higher than children 10-14 years old (129,211).

Helmets protect people from long-term health problems. Long-term health problems include short-term memory loss, inability to concentrate to coma and death. Some people could become disabled or die because of a serious head injury. Newton's Law of Motion number three explains this point. Law three states, for every action there is an equal and opposite reaction. When you fall your body reacts because of your force, the helmet takes the impact.

Children and adolescents are more at risk of injury. The second law of motion proves this point because children and adolescents have less mass, so less force is needed to move them. While head injuries due to accidents occur in all age groups, children and youths are disproportionately affect, comprising 42% of the head and spine traumas in the study (Art 2). Also children are at increased

Helmets help lower medical cost: For every action there is an equal and opposite reaction when you fall your body reacts because of the force, a helmet takes the impact.

Sincerely,

Information Sheet

Module Title: Earth Processes

Module Description (overview):
Students will write a report where they will argue which has the greater influence on the development of the earth's crust, constructive or destructive forces. They will use science texts, journals, and other sources to indentify examples of each type of force. They will determine the impacts of each on the earth, and construct an argument to defend their choice.

Template Task (include number, type, level)	Teaching Task
Task 2 (Argumentative/Analysis): [Insert essential question] After reading _____ (literature or informational text), write an _____ (essay or substitute) that addresses the question and support your position with evidence from text(s). **L2** Be sure to acknowledge competing views. **L3** Give examples from past or current events or issues to illustrate and clarify your position.	Task 2 (Argumentative/Analysis): While constructive and destructive forces shape the surface of the earth, which type has the greatest effect? After reading science texts and journals, write a report that addresses the question and support your position with evidence from texts. **L2** Be sure to acknowledge competing views. **L3** Give examples from past or current events or issues to illustrate and clarify your position.

Grade(s)/Level: 7th

Discipline: science

Course: Integrated Science

Note: No information for section *Materials, References, and Support* available for inclusion.

Literacy Design Collaborative Anchor Paper Annotation Form

Content Area: ☒ Science ☐ History-Social Studies ☐ English Language Arts

Mode: ☒ Argumentation ☐ Informational/Explanatory

Grade Level: 7

Template Task #: 2

Module Title: Earth Processes

Teaching Task: **While constructive and destructive forces shape the surface of the earth, which type has the greatest effect? After reading science texts and journals write a report that addresses the question and support your position with evidence from texts. Be sure to acknowledge competing views. Give examples from past or current events or issues to illustrate and clarify your position.**

Work Sample ID: MS-SCI.A2.Sample 56

Dimension	Score	Explanation of the Score / Evidence
Focus	2.5	Position that "Constructive forces make the most change" is carried through the writing. The prompt is addressed with little conviction about which force has the greatest influence. Information is relevant, but not particularly developed beyond a few examples; this contributes to a largely general focus.
Reading/Research	2	The resence of Works Cited gives some indication of outside research, but it's unclear where the development is a balance of the writer or the literature. Details are relevant to the main idea of the piece, but elaboration is missing; body paragraphs tend to give a brief definition and minor example that does not fully develop the idea of constructive forces.
Controlling Idea	2	Development of destructive forces is insufficient, even though it is briefly mentioned.
Development	2	Some details about past events are referenced. Mention of locations, such as the Mediterranean and the Indonesian Archipelago, lend specificity to the development; that the Himalayas "are still getting bigger to this day" is a simplistic, undeveloped detail that could be better elaborated to support the argument. Opening statements in each of the body paragraphs have some examples: ". . . new crust is created by magma pushing up from the mantle . . . this is in east Africa, spreading processes have already torn Saudi Arabia away . . . forming the Red Sea." However, the argument that constructive forces "make the most change" is not counteracted with details about destructive forces.
Organization	2.5	Paragraph introductions are varied, creating a sense of movement through piece. Within paragraphs, consistency is maintained with a brief introduction about each element set forth in the introduction: mountain formation, volcanic mountains, and divergent boundaries. Although each of the body paragraphs ends with an appropriate example about their individual aspects, there are no connections or transitions between them other than the indentation. Overall the organization attempts to structure the details into an argument, but details connecting the three main ideas are missing.
Conventions	2.5	Control of commas is demonstrated, with a few minor errors. "Also as South America continues to move away from Africa new crust is forming on the bottom of the Atlantic Ocean." Two commas are missing; yet, the sentence is correct in structure, and also demonstrates language appropriate to the task. Earlier, "The Hawaiian Islands*, formed from volcanoes,* are a great example . . ." shows correct comma usage setting off the description of the islands. This is appropriate because preceding lines emphasize the construction of volcanic mountains; the writing begins to show an understanding of how punctuation can emphasize content. Command of grammar is evident, though lack of development does not allow student an opportunity to show control of other elements.

Content Understanding	2	Claim is stated, “Constructive forces make the most change…” “Deformation,” “volcanoes,” and “divergent boundaries” provide supporting evidence to the claim. Scientific reasoning shows a basic understanding of earth processes, with a few connections to how this evidence supports their claim. Examples are also included, but explanations are not fully developed to clarify reasoning. (ex. in paragraph 2, it is alluded that all mountains are formed by “folding.”) In paragraph 4, “when a piece of land splits,” – it is not clear if there is an understanding of earth processes. (no mention of plates) Because citations are not expected, it is difficult to distinguish direct copy and student writing. Destructive forces are mentioned in the last sentence, but not developed.

This student would benefit from feedback, discussion and/or instruction in the following areas:

- Development of details beyond repeating what resources say, including making connections between ideas
- Using varied, engaging language to convince the audience

Constructive Forces

Constructive forces make the most change on the earth's crust. A constructive force is a force that builds the surface of the earth. A destructive force breaks down the surface of the earth. Constructive forces make the most change to the earth's crust because of the construction of mountains, construction of volcanic mountains, and the formation of divergent boundaries.

Mountains can be miles high. They are made by the process called deformation or "folding." When two plates collide they fold up like an accordion and then start to rise. This process makes mountains. The Himalayan Mountains in Asia are an example of this. The India plate is colliding with the Asian plate and is producing the Himalayas. These mountains are still getting bigger to this day.

Movements of tectonic plates create volcanoes along plate boundaries which erupt and make mountains. Most volcanoes occur in the pacific ring of fire and a place that extends from the Mediterranean across Asia to join the pacific band in the Indonesian Archipelago. These volcanoes constantly put out lava that increases the thickness of the earth's crust. The Hawaiian Islands, formed from volcanoes, are a great example of how this process builds up the crust.

Divergent boundaries are constructive because when a piece of land splits, new crust is created by magma pushing up from the mantle. An example of this is in east Africa, spreading processes have already torn Saudi Arabia away from the African continent, forming the Red Sea. Also as South America continues to move away from Africa new crust is forming on the bottom of the Atlantic Ocean.

In conclusion you have seen that the construction of mountains, formation of volcanic mountains, and the formation of divergent boundaries prove that constructive forces do make the most effect on the earth's crust. Don't forget that a constructive force is one that builds up the surface of the earth and a destructive force breaks down the surface of the earth.

Works Cited

"Mountain Formation." *Wikipedia, the Free Encyclopedia*. Web. 15 Mar. 2011. <http://en.wikipedia.org/wiki/Mountain_formation>.

"Mountain Building." *Windows to the Universe*. Web. 15 Mar. 2011. <http://www.windows2universe.org/earth/interior/mountain_building.html>.

DiSpezio, Michael A. "Movement of the Crust." *Science Insights*. Menlo Park, CA: Addison-Wesley, 1996. Print.

Overview

Overview | Invasive Species

Invasive Species

by [redacted]

Every country deals with problems that arise from invasive species. As a way to engage students in issues that affect them and to teach them examination of information to inform their opinions, a high interest engaging topic is selected. (In this module, the topic of invasive species was selected.) Students will learn how to examine texts which address multiple aspects of an issue in order to allow students to formulate their own claims based on the evidence within the texts. They will then wite an argument which supports their claim.

Grades: *7*

Discipline: *Science*

Course: *null*

Section 1: What Task?

TEACHING TASK

Task Template 7 — [3 Levels] *Argumentation & Problem/Solution*

L1: After researching articles on Invasive Species, write report that identifies a problem the impacts of exotic species on ecosystems and argues for a solution. Support your position with evidence from your research.

L2: Be sure to examine competing views.

STUDENT BACKGROUND

Every country deals with problems that arise from invasive species. After reading informatial and opinion texts students will write a report that addresses this and will argue what they feel the impacts of invasive species are on ecosystems.

EXTENSION

Literacy Design Collaborative Anchor Paper Annotation Form

Content Area: ☒ Science ☐ History-Social Studies ☐ English Language Arts

Mode: ☒ Argumentation ☐ Informational/Explanatory

Grade Level: 6

Template Task #: 2

Module Title: Invasive Species

Teaching Task: After researching articles on Invasive Species, write a report that identifies a problem with the impacts of exotic species on ecosystems and argues for a solution. Support your position with evidence from your research.

Achievement Level: MS-SCI.A2.Sample 93

Dimension	Score	Explanation of the Score / Evidence
Focus	3	The prompt is adequately addressed. The response defines invasive species and provides a generally convincing position that they are harmful. Specific elements of various species are explained, and help highlight the main idea that "exotic species that harm the environment should be culled or killed off."
Reading/Research	3	Details are relevant to the argument. Paragraph 2, for example, uses relevant details from outside sources to explain what zebra mussels and flying carp are capable of. On the third page, it is difficult to tell if a sentence is the student's or the biologist's words: ". . . but Davis says otherwise. Its clear that exotic species need to be taken care of before the environment is destroyed, or messed up." Either way, the shift digresses from the argument that they should be killed. Most details are purposefully chosen from the texts, and are slightly more developed on the first two pages.
Controlling Idea	2.5	A counterclaim is somewhat addressed, but muddled language can be confusing. The student acknowledges the income received from selling camel meat and argues that it still "cost more for their damages than they would make off their meat." But, it doesn't explain why simply killing them off would make up for the damage. While there is a general theme that invasive species are bad, it is not always clear what the opposing side thinks or how the problem could be solved other than a general "killing."
Development	3	Most ideas are developed and contain some relevant research and personal commentary, as in "So not only are they (camels) destroying the environment but also they're also hurting the plants and other things the environment need." With "I understand that not all of them harm or destroy the environment . . .", other views are addressed. Even though some details about the counterclaim are inconsistent, details explaining the harmful effects on environment and life are clear and emphasize the writer's claim.
Organization	2.5	The introduction presents a brief description and opinion on invasive species; several examples of species and supporting details are presented throughout. Transitions such as "so" and "for example" help move the reader along. However, there is repetition about species (especially camels) and ideas in subsequent paragraphs. The fifth paragraph has a confusing conclusion, in which the student implores "that exotic species need to be taken care of," but it is not clear if "taken care of" is a euphemism for the next paragraph's "killed off," or if it means 'cared for.'
Conventions	2	It is difficult to read through the second page, as errors across mechanics and

		grammar are prevalent: “So the people, who say this, are wrong because even exotic species that can gain the government or that environment money actually cost them more money for damages.” Several sentences like this are long-winded or fragmented and could benefit from editing. Lack of proper punctuation begins to interfere with meaning. Grammatical errors are present with the use of “their” instead of “they’re” and “then” for “than.” Tone is inconsistent. “I think that these camels and other animals that cause a lot of problems should just be killed off, but that’s what I think.” Sources are usually cited.
Content Understanding	2.5	The student identifies and describes negative environmental impacts of several invasive species but does not elaborate on the effects of increased competition for resources with native species, and the solution to “kill them off” is simplistic and not expanded upon. The explanations are confusing at times, but begin to show basic understanding.

This student would benefit from feedback, discussion and/or instruction in the following areas:

- Integrating research with personal opinion
- Choosing an overall claim and developing individual ideas in each paragraph
- Mechanics, especially punctuation and grammar
- Benefits of editing and review

The Growing Fear: Invasive Species

Do you know what an invasive species is? An invasive species is a species that was introduced to a new environment. Most invasive species ~~are~~ damage the environment they get introduced into, and cause a lot of problems for people who live in or around that environment. Something needs to be done about these species and where their living they need to be killed or moved into a different environment or into a closed off area I think. Read ahead and ill tell you more about the invasive species and what they do the environment.

Invasive species are also known as exotic species. A lot of exotic species cause damage and harm to the land and/or the people around them that environment. For example, from an article named *Zebra Mussels* "They can grow so densely that they block pipelines, clogging water intakes o municipal water supplies and hydro electric companies." So as you can see they cause a lot of damage to things around them. Another alien species called Asian carp can cause a lot of problems for people around the lakes or rivers where they are. For example, "Boaters and jet-skiers along the Illinois and Mississippi rivers have reported cuts, bruises and broken bones after being hit by flying carp, which can

weigh 100 pounds." Says the article *Asian Carp.* . So as you can tell these invasive species can cause a lot of problems for people around these environments.

Some people think that these non-native species can help the environment, but it's obvious that a great amount of them do nothing except hurt the environment they are put into. So the people, who say this, are wrong because even exotic species that can gain the government or that environment money actually cost them more money for damages. For example in the article *Outback Steakhouse* says "In their search for water, they soil Aboriginal drinking holes, destroy everything from fences to air conditioners, and cause more than $12 million worth of damage *each year."* So these camels in Australia even cause a lot of money, but some people think that they meat this made off them makes up for it but that's not correct because it cost more for their damages than they would make off their meat. Like the killer bees in Brazil they introduced, but there was no reason to introduce these because the only thing they do is kill more people then the others, the article *Killer Bees* says "Since their introduction into Brazil, they have killed some 1,000 humans, with victims receiving ten times as many stings as from the European strain." The European strain is the best that were already living there before the others were introduced.

Alien species cause a lot of problems for the environment for example, the camels from Australia "They feed on roughly 80 percent of Australia's plant species, and have pushed some to the brink of extinction." So not only are they destroying the environment but also they're also hurting the plants and other things the environment need. I think that these camels and other animals that cause a lot of problems should just be killed off, but that's what I think.

Some people think that these invasive species could be lucrative. This is understandable considering what sue species do the environment or does to harm it. For example, a biologist named Mark Davis in the article *Courting Controversy with a New View on Exotic Species* says, " I'm very careful to say that lots of invasive species are causing great problems." He says this because he has studied many different species and sponsors many companies who help with the environment after invasive species are introduced. Some people in this same article think, " Because native species evolved in a specific ecosystem and exotics didn't, natives are better suited for their niche." I agree with this also, but Davis says otherwise. Its clear that exotic species need to be taken care of before the environment is destroyed, or messed up.

In conclusion, I think that exotic species that harm the environment should be culled or killed off. I understand that not all of them harm or destroy the

environment, but a majority of them do and if nothing is done then that certain environment, where they are at, will be messed up, destroyed, and will be never the same. After reading this, I hope you have formed your own opinion on invasive species.

Sources

- Breining, Greg. "Courting Controversy with a New View on Exotic Species."
- Kamenev, Marina. "Outback Steakhouse."
- "Zebra Mussels." [Online] Available.
- "Killer Bees." Smithsonian Institution. 2011

Information Sheet

Module Title: Cryobiology

Module Description (overview):

Students have just finished units on States and Properties of Matter. They will take the concepts learned and expound upon them by examining the field of cryobiology. Cryobiology is the study of living things at very low temperatures. This science is filled with many technological advances. Students will examine the pros and cons of the techniques used and formulate an argument based on scientific facts.

Template Task (include number, type, level)	Teaching Task
Task 2 Template (Argumentation/Analysis L1): [Insert essential question] After reading _____ (literature or informational texts), write an _____(essay or substitute) that addresses the question and support your position with evidence from the text(s).	Should cryobiology techniques be used to preserve living matter for future use? After reading texts on cryobiology, write an article that addresses the question and support your position with evidence from the texts.

Grade(s)/Level: Grade Eight

Discipline: (e.g., ELA, science, social studies, other?) Science

Course: Physical Science

Author(s):

Contact information:

E. Materials, references and supports: List the materials you will need and students will use. Provide citations.

For Teachers and Students

Text for teaching task:

"Cryobiology." *Jrank.org*. Web. 11 Apr. 2011. http://science.jrank.org/pages/1888/Cryobiology.html

"Cryobiology: Opposition." *Cryobiology*. Web. 13 Apr. 2011. http://cryobiology.synthasite.com/ethics.php.

"Cryobiology." *World of Invention*. Thomson, Gale, 2005-2006. BookRags. Web. 11 Apr. 2011

"Freezing for the Future: Life-Saving Cryobiology." Research/University of Kentucky. Web. 13 Apr. 2011. http://www.research.uky.edu/odyssey/fall00/freezing.html.

Immortality on Ice. Discovery Channel Video, 1996. Videocassette.

The World of Absolute Zero: Films for the Humanities & Sciences, Inc. Videocassette.

Resources:

EasyBib (Free Bibliography Maker): http://www.easybib.com/
Oasis (A Personalized Learning Platform): http://alearningoasis.com/
Paideia Class (Active Learning): http://www.paideia.org/

Text Structures Chart
Argumentative Task Sheet
Cryobiology Directions for Reading and Taking Notes
Cryobiology Module Quick Write
Cryobiology – Argumentative Module Notes Sheets
Cryobiology Module – What is Needed Sheet
Vocabulary Sheet for Writer's Notebook
Argumentative Essay on Zoos (As a Sample) http://www.tesoltasks.com/FivePara.htm
Cryobiology Argumentative Module Brainstorming Article Organizer
List of Common Transitions
Revising the Rough Draft Sheet
Why Cite Sheet
Cryobiology Essay Rubric

Literacy Design Collaborative Anchor Paper Annotation Form

Content Area: ☒ Science ☐ History-Social Studies ☐ English Language Arts

Mode: ☒ Argumentation ☐ Informational/Explanatory

Grade Level: 8

Template Task #: 2

Module Title: Cryobiology

Teaching Task: **Should cryobiology techniques be used to preserve living matter for future use? After reading texts on cryobiology, write an article that addresses the question and support your position with evidence from the texts.**

Work Sample ID: MS-SCI.A2.Sample 21

Dimension	Score	Explanation of the Score / Evidence
Focus	4	Prompt is addressed appropriately and concisely, beginning with a commitment to the reader using concise language: ". . . cryobiology techniques should be used to preserve living matter for future use because they can positively affect people's lives, allowing them to experience more of the simple pleasures that every day brings." Acknowledging the human element helps illustrate the writer's opinion about cryobiology.
Reading/Research	4	Information is accurate and relevant. There is an appropriate balance of selected outside sources and writer development. In the second paragraph, details about positive reproductive implications include two sources about human and animal information, describe each aspect of the fertilization, and relate the two: ". . . embryo preservation . . . greatly impacts the world." This is a relevant summary that shows skill in connecting pieces of information, and also makes a credible point to the audience.
Controlling Idea	3.5	A clear purpose is maintained. The human element – embryonic and organ transplant, stem cells to treat cancer – is referred to, but other anecdotal research/ evidence could support the argument. Personal conviction is maintained through each paragraph, and details help support the argument.
Development	3.5	Specific details about infertile women, dairy cows, organ preservation, and cancer research support the argument for cryobiology. Details regarding some aspects are not equally developed, but they are always relevant; vitrification and cryprotectants are not explained. Description of stem cells is direct yet thorough, examples of specific types of cancer adding information. The conclusion is slightly repetitive and is not as developed as the body paragraphs, creating a disparity in the level of detail compared to other paragraphs. The Gao quote adds credible insight from an outside source and further emphasizes the writer's confidence.
Organization	4	Structure effectively carries the reader through an exploration of cryobiology. Despite a couple of simplistic transitions ("One way," "Secondly"), paragraphs are inter-related. The ideas funnel from more global (infertility across mammals) to individual (medical), all while carrying a theme of cryobiology positively affecting lives. The argument is clear through the presentation of details.
Conventions	4	Command of conventions is evident. Spelling is correct, and language is usually precise and contributes to meaning: "Thus, blood stem cells are preserved so they can re-establish the patients' blood system after chemotherapy, and umbilical cord blood cells are more likely to be accepted by the body." Tone is consistent and appropriate to both audience and purpose, and is maintained. Sentence structure and use of internal punctuation shows command: "Processes like vitrification and using cryoprotectants/anti-freezes could help organs to be preserved with less damage, and eventually could allow them to be preserved without any damage."

Content Understanding	3	Claim, “cryobiology techniques should be used to preserve living matter for future use…” is supported with evidence (“embryo preservation,” “preserve organs for transplant,” and “…techniques can save lives through preserving umbilical cord blood and stem cells”) from the references. The scientific reasoning to help explain the evidence is sometimes unclear with possible misconceptions regarding what we can do today and what we would like to achieve in the future. There is not enough information (paragraph 3) that demonstrates an in-depth understanding.

This student would benefit from feedback, discussion and/or instruction in the following areas:

- Using counterarguments as fuel to support claim

Cryobiology

Long before our modern-day technologies, people's legs were amputated if they were severely injured, and if their heart stopped working, they were dead with no way to come back to life. Now, techniques found in cryobiology help prolong the lives of humans and could, in the future, bring them back to life. Cryobiology is the study of the effects that extremely low temperatures have on living matter. This area of science allows us to preserve embryos. Also, techniques could be used to preserve organs for transplant. Lastly, cryobiology can be used to save lives by storing umbilical cord blood and stem cells. Therefore, cryobiology techniques should be used to preserve living matter for future use because they can positively affect people's lives, allowing them to experience more of the simple pleasures that every day brings.

One way cryobiology techniques impact lives is through embryo preservation. Some women want to have children, but they cannot because they are infertile. Cryobiology allows these women to preserve egg cells, have them fertilized, and later, have them implanted into their uteri so they can have children ("The World"). Without cryobiology, infertile women would not be able to have children and would miss out on being mothers. Other positive aspects of embryo preservation are preventing animals from going extinct and use as a future food source. Since hundreds of eggs can be harvested from a single dairy cow and later implanted in other cow mothers ("Cryobiology" Jrank), there can be more cows which provide milk, butter, cheese, and meat. As the population is rapidly increasing, mass producing cows this way could be an easy way to acquire food. Also, mass producing any kind of animal will increase its population and keep it from going extinct. To end, the cryobiology technique of embryo preservation should be used because it greatly impacts the world.

Secondly, cryobiology techniques should be used because they could preserve organs for transplant. As of right now, kidneys can only be preserved for three days, livers for 36 hours,

and hearts and lungs for six hours (“Cryobiology” Jrank). With the help of cryobiology, organs like these could be preserved and used whenever they are needed. Availability of organs at any moment is crucial for patients to survive. Processes like vitrification and using cryoprotectants/anti-freezes could help organs to be preserved with less damage, and eventually could allow them to be preserved without any damage. In conclusion, it is very important that we use cryobiology as it could help to preserve organs for transplanting in the future.

Perhaps the greatest reason cryobiology should be used is because techniques can save lives through preserving umbilical cord blood and stem cells. To start off, umbilical cord blood is full of stem cells, just like bone marrow, and stem cells help build strong immune systems. These stem cells, especially those from umbilical cords, help treat several illnesses, including several types of anemia, leukemia, brain tumors, and breast cancer (“Freezing”). Also, chemotherapy kills many stem cells which are important for a healthy blood system. Thus, blood stem cells are preserved so they can re-establish the patients’ blood system after chemotherapy, and umbilical cord blood cells are more likely to be accepted by the body. As you can see, cryobiology is necessary for human lives to be saved.

Cryobiology techniques are essential for positively impacting people’s lives and therefore, should be used to preserve living matter for future use. Through embryo preservation, infertility can be treated and animal populations can be re-established. In the future, organs could be preserved for transplant which will help prolong many lives. Finally, umbilical cord blood and stem cells can help treat illnesses like leukemia, breast cancer, anemia, and brain tumors. As Dayong Gao says, “I believe one of the most important purposes of why we study science, why we do research, is to improve the environment and our health…If we can preserve living cells, tissues, and organs, we can save lives.” (Freezing”) Gao is truthful in saying we research to improve the environment and our health; thus cryobiology needs to be used to preserve living matter for use in the future.

Bibliography

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