Answer for activities based on Grassroots attack on bilharzia passage

Activity 2.1

Question – 1

One notable Ethiopian scientist who has made a significant impact is Dr. Gebisa Ejeta. He is renowned for his groundbreaking work in plant genetics, particularly in developing drought-resistant sorghum hybrids. Sorghum is a vital food source in Africa, and his research has greatly contributed to enhancing food security for millions of people across the continent. In recognition of his exceptional contributions, Dr. Ejeta was awarded the National Medal of Science by U.S. President Joe Biden in 2023【20†source

Dr. Ejeta's work focuses on creating sorghum strains that can withstand harsh environmental conditions, such as droughts and parasites.

Dr. Tewolde Berhan Gebre Egziabher is an Ethiopian environmental scientist known for his work in biodiversity conservation and sustainable agriculture. He has played a significant role in advocating for the rights of developing countries in international environmental negotiations, particularly in relation to genetic resources and intellectual property rights. Dr. Gebre Egziabher has been influential in promoting policies that protect the interests of small farmers and indigenous communities against the exploitation of their genetic resources by multinational corporations. His efforts have earned him recognition and awards, including the Right Livelihood Award, also known as the "Alternative Nobel Prize."

Question - 2

Prioritizing the values of scientific discovery depends on various factors, including societal needs, current technological capabilities, and individual perspectives. However, a general order of importance can be proposed based on their impact on human progress and well-being. Here is one such order with justifications:

1. \*\*Developing Technology\*\*:

- \*\*Justification\*\*: Technological advancements drive economic growth, improve quality of life, and enable further scientific discoveries. For instance, the development of the internet has revolutionized communication, education, and commerce globally. Technological innovations like medical devices and renewable energy sources directly improve health and sustainability【21†source】 .

2. \*\*Solving Everyday Problems\*\*:

- \*\*Justification\*\*: Practical applications of scientific discoveries can significantly enhance day-to-day life. For example, advancements in agricultural science have improved food production and safety, directly addressing hunger and nutrition issues【21†source】. Innovations in transportation and housing also improve living conditions and convenience.

3. \*\*Addressing Societal Issues\*\*:

- \*\*Justification\*\*: Science plays a crucial role in tackling large-scale societal challenges such as climate change, public health crises, and social inequalities. Scientific research informs policies and interventions that can mitigate these issues. For instance, epidemiological studies guide responses to pandemics like COVID-19, saving lives and shaping public health strategies【21†source】.

4. \*\*Building Knowledge\*\*:

- \*\*Justification\*\*: The pursuit of knowledge for its own sake lays the foundation for future discoveries and innovations. Understanding fundamental principles in fields like physics, chemistry, and biology can lead to unexpected applications and technologies. For example, the study of quantum mechanics has led to the development of semiconductors and thus modern electronics .

5. \*\*Satisfying Curiosity\*\*:

- \*\*Justification\*\*: Human curiosity drives exploration and discovery, leading to a deeper understanding of the universe. While this may seem less immediately practical, it inspires future generations of scientists and can lead to serendipitous breakthroughs. Historical examples include the accidental discovery of penicillin and the development of the theory of relativity .

\*\*Conclusion\*\*: While developing technology and solving everyday problems may appear to have the most immediate and tangible benefits, addressing societal issues is crucial for long-term sustainability and equity. Building knowledge and satisfying curiosity are fundamental to the scientific endeavor, ensuring a continuous cycle of discovery and innovation. Ultimately, these values are interdependent, each contributing to the overarching goal of advancing human knowledge and improving quality of life.

Question 3-

\*\*a) New scientific knowledge may lead to new applications.\*\*

- \*\*Explanation\*\*: The process of scientific discovery often results in new knowledge that can be applied to create innovative technologies and solutions. For example, the discovery of the structure of DNA led to the development of genetic engineering and biotechnology, enabling advancements in medicine, agriculture, and forensics. This principle is a cornerstone of applied science, where theoretical knowledge finds practical uses.

- \*\*Example\*\*: The understanding of electromagnetism led to the invention of electric generators, motors, and a wide range of electronic devices【20†source】【21†source】.

\*\*b) New technological advances may lead to new scientific discoveries.\*\*

- \*\*Explanation\*\*: Technological innovations can provide scientists with new tools and methods to explore and understand the natural world more effectively. For instance, the invention of the telescope and microscope opened new frontiers in astronomy and biology, respectively. Technology often enables scientists to test hypotheses and collect data that were previously inaccessible.

- \*\*Example\*\*: The development of the Large Hadron Collider (LHC) has led to significant discoveries in particle physics, including the confirmation of the Higgs boson【21†source】.

\*\*c) Potential applications may motivate scientific investigations.\*\*

- \*\*Explanation\*\*: The desire to solve practical problems or improve existing technologies can drive scientific research. Many scientific endeavors are initiated with the goal of finding solutions to specific challenges, leading to targeted investigations and breakthroughs. For example, the quest for renewable energy sources has spurred extensive research into solar cells, wind turbines, and biofuels.

\*\*Example\*\*: The search for more efficient energy storage solutions has motivated research into advanced battery technologies, resulting in developments like lithium-ion batteries that power everything from smartphones to electric vehicles【21†source】.

\*\*Conclusion\*\*: Each statement highlights a different aspect of the dynamic relationship between science and technology. New scientific knowledge can lead to practical applications, technological advances can open new avenues for scientific discovery, and the potential for practical applications can drive scientific inquiry. This interplay is fundamental to progress in both science and technology, ensuring that each field continually benefits and advances the other.

Activity 2.2

1. The main idea of the paragraph is that an African researcher has made progress using an indigenous plant pesticide to combat bilharzia, a parasitic disease affecting 250 million people in the Third World.

2. The effectiveness of the pesticide, its impact on the local community in Adwa, and the broader implications for combating bilharzia globally.

Activity 2.3

### Ideas of Each Paragraph:

1. \*\*Paragraph 1\*\*:

- \*\*Idea\*\*: Bilharzia is a widespread parasitic disease similar to malaria, affecting 250 million people in developing regions, primarily among poorer communities. It is transmitted through contaminated water and is debilitating but not fatal.

2. \*\*Paragraph 2\*\*:

- \*\*Idea\*\*: Despite its severe impact, bilharzia has not been a major focus for health interventions outside of China. Treatment is expensive and often ineffective in areas with high rates of reinfection. Limited efforts have been made using commercial pesticides to eradicate the parasite’s intermediate host.

3. \*\*Paragraph 3\*\*:

- \*\*Idea\*\*: Dr. Aklilu Lemma's research at Haile Selassie University has introduced a novel, affordable pesticide derived from a local plant to control bilharzia. This five-year pilot project in Adwa could provide a scalable solution for bilharzia control in Ethiopia and other countries.

### How the Ideas are Related:

- The paragraphs build on each other by first explaining the severity and distribution of bilharzia, then discussing the challenges and limitations of current control methods, and finally presenting Dr. Lemma's innovative approach as a potential breakthrough in combating the disease on a larger scale.

### Summary of the Paragraphs:

Bilharzia, a debilitating parasitic disease affecting 250 million people in poor communities, has not been a major target for health interventions due to the high cost and limited effectiveness of treatments. Dr. Aklilu Lemma's five-year pilot project in Adwa, Ethiopia, using a locally derived pesticide, offers a promising, cost-effective method for controlling the disease, potentially applicable in other regions as well.

Activity 2.4

1. Eggs from the mature parasite are continually excreted by infected persons or animals. If they reach water, they hatch into an intermediate form which seeks out a snail host. In the snail, after further transformations, the parasite begins to release numerous ‘cercariae’ the form which affects man.
2. Bilharzia control primarily focuses on eradicating snails, the intermediate host, while also limiting human contact with potentially infected water sources. Treatment plays a secondary role.

Activity 2.5:

Instruction: Write a conclusion of your own to the passage above.

**Conclusion**

The grassroots initiative led by Dr. Aklilu Lemma in Adwa, Ethiopia, offers a promising and cost-effective method to combat bilharzia using a locally sourced plant, endod. This innovative approach not only reduces the disease's prevalence but also encourages community involvement in health control. By leveraging indigenous knowledge and resources, the project exemplifies a sustainable and practical solution for other developing regions plagued by bilharzia. Dr. Lemma's work highlights the potential of integrating traditional practices with scientific research to address pressing health issues in impoverished communities.

Activity 2. 6:

Instruction: Answer the following questions based on the information in the passage

**1.What are the three continents that were ravaged by bilharzia?**

* Asia, Africa, and Latin America.

2.**What are the symptoms of bilharzia?**

* Bilharzia causes internal bleeding, malfunctions of the bladder, liver, and intestines, saps energy, and shortens the lifespan. It is a debilitating disease that can take years for tissue damage to manifest.

**3.Why is it easy to apply Aklilu’s pesticide in developing countries?**

* Aklilu’s pesticide, derived from the endod plant, is locally available, inexpensive, and can be easily applied using simple tools like watering cans. The endod plant is popular and readily accessible in the region, making the process cost-effective and manageable by the community.

**4.Why is malaria’s vector considered ‘democratic’ by the author?**

* Malaria’s vector, the mosquito, affects people across different socioeconomic statuses, unlike bilharzia, which primarily affects poorer communities due to their higher exposure to contaminated water.

**5.Why did the author describe the discovery of the cure for bilharzia at Adwa as incidental?**

* The discovery was incidental because Dr. Lemma stumbled upon it while conducting a survey of the snail population and observed that the snails were being killed by a substance in the local villagers' soap made from endod berries, rather than through a directed search for a bilharzia cure.

Activity 2.7:

Instruction: The following words are taken from the reading passage you have read. Use the word that has a similar meaning with the word in italics in the following sentences.

1. It occasionally happens that a change in \*\*dilution\*\* affects the chemical action that occurs.

2. This acute infection of the brain is almost \*\*invariably\*\* fatal.

3. What we're accomplishing with Howie is \*\*vital\*\*; we can't stop doing it.

4. That is the \*\*insidious\*\* nature of gambling that must be controlled.

5. The teacher felt she needed to \*\*dispense\*\* compliments to each student so that they could feel better about themselves.

6. The public work suffers from the \*\*ravages\*\* of white ants.