Real World Topics

Food Security

Civics & Society

Practice Problem 1 - October 5, 2024 by 12 noon

How might food security issues of availability, access, and affordability essential for living a healthy life impact society in the future?

Rising Sea Levels

Science & Technology

Practice Problem 2 - November 16, 2024 by 12 noon

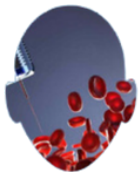
How might rising sea levels impact our coastlines, industries, and people's lives in the future?

Agricultural Industry

Business & Economics

Qualifying Problem - January 28, 2025 by 12 noon

How might the agricultural industry adapt to the needs of feeding a growing world population in the future?



Nanotechnology

Science & Technology

Affiliate Finals Problem - March 21 - 22, 2025

How might the use of nanotechnology in medicine, healthcare, and other industries affect humanity in the future?

International Conference

TBD

We invite regional affiliate champions to attend our International Conference and compete alongside their peers. We will announce a fifth problem topic on **March 1, 2025** for use at our world finals event on **June 4-8, 2025** at Indiana University in Bloomington.

Visit our topic center to learn more about each topic and access topic-specific resources.

Contact Affiliate Future Problem Solving

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Visit: vafps.org

Practice Problem 1

Food Security

Civics & Society

How might food security issues of availability, access, and affordability essential for living a healthy life impact society in the future?

Visit our topic center to learn more about our Food Security topic, view suggested readings and access additional resources.

Context

Food security is different in every place and yet impacts every society. Infrastructure, environmental conditions, and political stability can all have significant impacts on the production of food. Environmental events such as droughts and rising sea levels also impact existing food sources. Economic, legal, and social barriers may thwart access to available food. Political conflicts, for example, interrupt supply chains and divert food away from those in need. Even when there is enough food available, and people have access to it, their food security may be threatened by the safety of the food.

Background

Nutritious food is a basic human need. While global food production has expanded, approximately one in three people remain food insecure. Food availability – how much food exists – is the first hurdle to feeding the global population.

Challenge

- What is the greatest challenge to food security?
- How can food security be improved to provide for the future needs of a growing world population?

Central Themes

1. The global risks to food security
2. Going hungry surrounded by food
3. Quality of food
4. Reaching Zero Hunger by 2030

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Practice Problem 2

Rising Sea Levels

Science & Technology

How might rising sea levels impact our coastlines, industries, and people's lives in the future?

Visit our topic center to learn more about our Rising Sea Levels topic, view suggested readings and access additional resources.

Context

Historically, human civilizations have responded to the risk of rising sea levels with retreat and adaptation. As our cities have become more permanent in modern times, defensiveness is the preferred strategy. The adequate protection of low-lying regions and coastal cities from flooding, land loss, water-logging, and groundwater salinity is costly and technologically complex. Small island nations are most vulnerable to the relocation of coastal communities.

Sea level rise is already occurring around the globe at unprecedented rates. The challenges will only continue to grow in the next few decades. It is important for scientists and engineers to work directly with communities to create policies that work for the unique circumstances of each vulnerable coastline.

Background

Two processes cause sea-level rise: thermal expansion (ocean water expansion as it heats up) and additional water flow into oceans from ice that melts on land. The IPCC (Intergovernmental Panel on Climate Change) reports that sea levels have risen by 0.19 meters since the beginning of the 20th Century. Sea level rise will continue for centuries, if not thousands of years, after greenhouse gas concentrations are stabilized, due to the long lag times involved in warming the oceans and ice sheets' response, possibly affecting over 400 million people.

Challenge

- How might the rate of rising sea levels be slowed?
- What can be done to protect coastal communities from rising sea levels?
- How might displaced people survive the hardships associated with the loss of their homes and their livelihoods due to future rising sea levels?

Central Themes

1. Ice melts
2. Thermal expansion
3. Impact on humans
4. Ecosystems at risk

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FUTURE Problem Solving

Qualifying Problem

Agricultural Industry

Business & Economics

How might the agricultural industry adapt to the needs of feeding a growing world population in the future?

Visit our topic center to learn more about our Agricultural Industry topic, view suggested readings and access additional resources.

Context

Agricultural industry is not only a vital component of global economies, but also a critical driver of environmental impact and social development. It encompasses a wide range of activities, from crop cultivation to livestock management. It provides food, textiles and biofuels to a growing population. While industrial agriculture has improved crop yields and increased accessibility and affordability, past and current farming practices have raised concerns related to sustainability. As the world's largest consumer of water and land, agriculture must seek sustainable farming practices to ensure its survival. The excessive use of these resources raises questions about the long-term viability of current agricultural practices. Addressing challenges will require innovative approaches, sustainable farming practices, and lastly, an analysis of how we produce and consume food.

Background

Agriculture is a complex, multi-faceted industry which impacts societies worldwide via the economy, the environment, and most importantly human development. Agriculture is based on the science of cultivating plants, animals, and other life forms for food, fiber, and fuel.

For thousands of years, farming practices have evolved in the use of land, crops, and technology. Small farms, with farmers caring for the land and its inhabitants, are increasingly rare, as most of the world's food is produced on an industrial scale. Industrial agriculture brings high-yield crops, often requiring extreme land exploitation and increased chemical applications. These advances in agriculture have made nutritious food more affordable and accessible. While the agricultural industry in place today is sufficient to feed the current population of planet Earth, it is also affecting the overall health of the planet.

Challenge

- What factors influence where and what can be grown, production levels, and profits?
- How will the agricultural industry adapt to feed the world's growing population?
- How can we make farms profitable while protecting the environment and natural resources?

Central Themes

1. Agricultural industry drives the global economy
2. Sustainability and environmental concerns
3. Food system resilience
4. Smart farming

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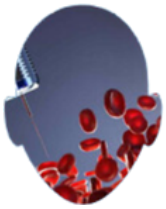
Affiliate Finals Problem



Nanotechnology

Science & Technology

How might the use of nanotechnology in medicine, healthcare, and other industries affect humanity in the future?

Visit our topic center to learn more about our Nanotechnology topic, view suggested readings and access additional resources.

Context

Nanotechnology is widely used in food industries, medicine, energy, automobiles, the environment, electronics, textiles, and cosmetics. Nanotechnology has direct benefits for medicine and the environment, but it may have unintended effects, like all technologies. Nanoparticles of typically unharmful materials, for example, can be toxic if inhaled. Not easily observed, nanotechnology poses risks to security and privacy.

Background

Nanotechnology deals with dimensions and tolerances of less than 100 nanometers. A single strand of human hair, for scale, is typically 100,000 nanometers thick! At this scale, individual atoms of larger materials can be manipulated. Placing atoms as though they were bricks, nanotechnology has the potential to give control over the structure of matter, allowing us to build powerful, yet microscopic substances.

Challenge

- What advances for society could new nanotechnology products enable?
- How might nanotechnology benefit all sectors of society?
- As the technology becomes more commonplace, how can we prepare for the unexpected risks and dangers associated with its use?

Central Themes

1. Nanotechnology on the market
2. Nanomedicine
3. Nanotechnology and the environment
4. Into the unknown

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