

## **AE.BIO. Bio-Related Technology**

### **Essential Discipline Goals**

- Demonstrate knowledge of the relationship of technological achievements and their impact on the environment, the advancement of science, the individual, and society.
- Demonstrate the ability to solve problems with technology using a systems approach, higher order thinking skills, individual and collaborative ingenuity, and a variety of resources including information, tools and materials.
- Demonstrate the safe, effective and creative use of technological resources—including tools machines, and materials—in performing technological processes.
- Develop technological literacy and the ability to adapt to future change.

### **Standards**

#### **Indicators**

- AE.BIO.05** Demonstrate knowledge of and apply skills related to Bio-Related Technology. 1.1
- AE.BIO.05.01** Identify elements of technology. 2.1
  - AE.BIO.05.02** Differentiate between biotechnology and bio-related technology. 1.2.5
  - AE.BIO.05.03** Describe how bio-related technology improves human existence on earth. 6.4.2
  - AE.BIO.05.04** Describe and use the systems model as it relates to bio-related technology to solve a problem. 1.2.1
- AE.BIO.10** Understand the social and economic implications of applying bio-related technologies on society 2
- AE.BIO.10.01** Describe the importance that bio-related technology has on our social wellbeing. 4.3.2/2.1.3
  - AE.BIO.10.02** Describe the role of bio-related technology to the global economy. 2.1.3
  - AE.BIO.10.03** Identify the economic importance of the bio-related technology industry. 4.3.4, 2.1.4
  - AE.BIO.10.04** Recognize the effects that supply and demand have on bio-related technology. 2.1.2
  - AE.BIO.10.05** Identify career opportunities in bio-related technology. 2.1.4
- AE.BIO.15** Recognize the use of bio-related technologies in managing the environment. 2.2.4
- AE.BIO.15.01** Recognize benefits of recycling. 1.1.2
  - AE.BIO.15.02** Identify methods for processing waste material. 4.1.3, 2.1.3
  - AE.BIO.15.03** Identify sources of soil, water and air pollution. 4.1.3, 2.1.3
  - AE.BIO.15.04** Identify methods used to prevent soil, water and air pollution. 4.1.3, 2.1.3
  - AE.BIO.15.05** Predict and observe the effect of waste on soil, water and air. 4.1.3, 2.1.3
- AE.BIO.20** Recognize the importance of bio-related technologies on health and care services. 1.1.2
- AE.BIO.20.01** Explain how diet and nutrition play an important role in proper health maintenance
  - AE.BIO.20.02** Identify bio-related technology used to diagnose, prevent and treat disease. 1.1.2
- AE.BIO.25** Demonstrate the role of bio-related technology and its importance to genetic engineering 1.1.2
- AE.BIO.25.01** Explain how the science of genetics is applied to food and fiber production. 3.2.3
  - AE.BIO.25.02** Identify moral and ethical considerations used in developing new genetically altered plant and animal products. 4.4.1
  - AE.BIO.25.03** Discuss how genetics have improved the product. 2.1.3
- AE.BIO.30** Identify the political factors that affect the development and implementation of bio-related technologies 6.4.1
- AE.BIO.30.01** Identify the political factors that affect the development of new products. 6.4.5
  - AE.BIO.30.02** Explain the role of regulatory agencies such as EPA and FDA in using bio-related technologies. 4.2.5
- AE.BIO.35** Recognize the use of bio-related technologies and its importance in food production and processing. 2.1.3
- AE.BIO.35.01** Describe modern methods of plant and animal production. 1.1.4
  - AE.BIO.35.02** Design and construct a technological system to dry and preserve food. 1.2.7
  - AE.BIO.35.03** Compare artificial and natural pest control management.
- AE.BIO.40** Identify ergonomic factors that can affect product development and service. 4.2.7

- AE.BIO.40.01** Identify terms, ergonomics and human factor engineering. 5.1.1
- AE.BIO.40.02** Apply ergonomic concepts to a variety of problems, resulting in a product or system. 1.2.7
- AE.BIO.40.03** Explain how human factor engineering allows people to be more productive in the workplace. 2.2.1
- AE.BIO.40.04** Discuss the bio-technical careers made available due to the advent of prosthetic devices. 2.1.4
- AE.BIO.45** Recognize the role that bio-related technology plays in fuel and bio-chemical production. 2.2
  - AE.BIO.45.01** Describe how chemicals and fuels are processed for bio-related technology. 2.2.2
  - AE.BIO.45.02** Define bio-mass and describe its uses. 2.2.2
  - AE.BIO.45.03** Identify bio-synthetic products 2.2.2
- AE.BIO.50** Recognize biological techniques used in material production 1.1
  - AE.BIO.50.01** Describe how bio-related materials are transformed chemically 2.2.2
  - AE.BIO.50.02** List the types of metal transformation 2.2.2
  - AE.BIO.50.03** Explain the process of bio-deterioration 2.2.2
  - AE.BIO.50.04** Recognize biological techniques used in materials production 1.1
- AE.BIO.55** Understand the rationale for regulations governing bio-related technology 2.2.4-6
  - AE.BIO.55.01** Define the term regulation and describe the need for regulations in the field of bio-related technology 2.1.3
  - AE.BIO.55.02** Identify regulators, legislatures and agencies that regulate bio-related technology 4.2.4
  - AE.BIO.55.03** Analyze motives to act or not to act in making regulations 2.1.3
  - AE.BIO.55.04** Define the term patent and explain the process used to obtain a patent