

**Human Anatomy and Physiology Year-at-a-Glance**  
**ARKANSAS STATE SCIENCE STANDARDS**

<u>FIRST SEMESTER</u>		<u>SECOND SEMESTER</u>		
<u>Unit 1</u> Body Organization	<u>Unit 2</u> Integumentary, Skeletal, Muscular Systems	<u>Unit 3</u> Endocrine and Nervous Systems	<u>Unit 4</u> Circulatory and Respiratory Systems	<u>Unit 5</u> Digestive, Urinary, and Reproductive Systems
6 weeks	10 weeks	6 weeks	7 weeks	9 weeks
<ul style="list-style-type: none"> <li>● HAP-LS4-1AR</li> <li>● HAP-LS5-1AR</li> <li>● HAP-LS6-1AR</li> </ul>	<ul style="list-style-type: none"> <li>● HAP-LS1-1AR</li> <li>● HAP-LS2-1AR</li> <li>● HAP-LS3-1AR</li> <li>● HAP-LS4-1AR</li> <li>● HAP-LS5-1AR</li> <li>● HAP-LS6-1AR</li> <li>● HAP-LS7-1AR</li> <li>● HAP-LS8-1AR</li> <li>● HAP-LS8-2AR</li> <li>● HAP-LS8-3AR</li> </ul>	<ul style="list-style-type: none"> <li>● HAP-LS1-1AR</li> <li>● HAP-LS2-1AR</li> <li>● HAP-LS3-1AR</li> <li>● HAP-LS4-1AR</li> <li>● HAP-LS5-1AR</li> <li>● HAP-LS6-1AR</li> <li>● HAP-LS7-1AR</li> <li>● HAP-LS8-1AR</li> <li>● HAP-LS8-2AR</li> <li>● HAP-LS8-3AR</li> </ul>	<ul style="list-style-type: none"> <li>● HAP-LS1-1AR</li> <li>● HAP-LS2-1AR</li> <li>● HAP-LS3-1AR</li> <li>● HAP-LS4-1AR</li> <li>● HAP-LS5-1AR</li> <li>● HAP-LS6-1AR</li> <li>● HAP-LS7-1AR</li> <li>● HAP-LS8-1AR</li> <li>● HAP-LS8-2AR</li> <li>● HAP-LS8-3AR</li> </ul>	<ul style="list-style-type: none"> <li>● HAP-LS1-1AR</li> <li>● HAP-LS2-1AR</li> <li>● HAP-LS3-1AR</li> <li>● HAP-LS4-1AR</li> <li>● HAP-LS5-1AR</li> <li>● HAP-LS6-1AR</li> <li>● HAP-LS7-1AR</li> <li>● HAP-LS8-1AR</li> <li>● HAP-LS8-2AR</li> <li>● HAP-LS8-3AR</li> </ul>

Recurring

**RST.11-12.2** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

**RST.11-12.3** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

**RST.11-12.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

**RST.11-12.9** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**WHST.11-12.1** Write arguments focused on discipline-specific content

[Unit 1](#)

[Unit 2](#)

[Unit 3](#)

[Unit 4](#)

[Unit 5](#)

<b>Unit 1</b>	Body Organization	<b>Grade Level</b>	10-12	<b>Approx length</b>	6 weeks
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**CPSD Power Standards with Student Learning Objectives**

**HAP-LS4-1AR** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

**Student-Friendly Objectives:**

- I can use technology to manipulate conditions within the body/environment to predict a response
- I can describe how cells of the body would react to different environments.
- I can predict the body’s response to maintain homeostasis under certain conditions.
- I can distinguish between positive and negative feedback loops and provide examples and explanations of how these loops maintain homeostasis.
- I can identify diseases that impact specific body systems and explain the effects of the disease on homeostasis, both in the system and body.

**HAP-LS6-1AR** Construct and revise an explanation for the cycling of matter and flow of energy among body systems and their associated processes.

**Student-Friendly Objectives:**

- I can explain how the body obtains nutrients and how these nutrients are used in structure, function and energy production.
- I can explain how various nutrients are cycled through the body
- I can explain how the mitochondria of each cell produces the energy needed for body function.
- I can explain how different systems use energy.
- I can explain how a deficiency in a nutrient will contribute to a decline in health.

**Learning Indicators of Power Standards**

Students will know...

- Homeostasis begins at the cellular level
- Individual systems will react to maintain homeostasis
- Individual actions of one system will impact actions of another system
- Each system of the body is dependent on energy production (ATP) at the cellular level in order to complete physiological processes
- Each body system requires energy for internal function, repair, building, cell and tissue maintenance and supporting external activities
- The body uses the cycling of matter to obtain necessary nutrients for structure and function and to eliminate waste products

And be able to...

- Develop a cell membrane model to demonstrate homeostasis and make predictions for cells in multiple environments.
- Utilize digital simulations to predict homeostasis in various conditions.
- Analyze and interpret information from case studies in order to predict the body’s response to maintain homeostasis.
- Explain positive and negative feedback loop examples as appropriate for individual body systems.
- Explain how different diseases impact the overall homeostasis of the body.
- Describe how nutrients are derived from various sources (food,

water, environment) and utilized in specific structures in order for the system to function.

- Describe how ATP contributes to function at the cellular level.
- Explain how deficiencies in the cycling of matter can impact overall body health.

**Additional Arkansas State Standards**

- **HAP-LS5-1AR** Argue from evidence the cause(s) for a dysfunction in a body system and the mechanisms by which it occurred.

<b>Unit 2</b>	Integumentary/Skeletal/Muscular Systems	<b>Grade Level</b>	10-12	<b>Approx Length</b>	10 weeks
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**CPSD Power Standards with Student Learning Objectives**

**HAP-LS2-1AR** Develop and use a model to identify and describe the relationship between the structures and physiological processes of each body system: Integumentary System, Skeletal System, and Muscular System

**Student-Friendly Objectives:**

- I can identify and describe the structure and function of various cell types.
- I can use a microscope to identify and illustrate various cell types.
- I can explain how cells are organized to develop tissues, organs and organ systems.
- I can use models to identify structures of specific systems/organs and explain how structure determines function.

**HAP-LS4-1AR** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

**Student-Friendly Objectives:**

- I can use technology to manipulate conditions within the body/environment to predict a response
- I can describe how cells of the body would react to different environments.
- I can predict the body’s response to maintain homeostasis under certain conditions.
- I can distinguish between positive and negative feedback loops and provide examples and explanations of how these loops maintain homeostasis.
- I can identify diseases that impact specific body systems and explain the effects of the disease on homeostasis, both in the system and body.

**HAP-LS6-1AR** Construct and revise an explanation for the cycling of matter and flow of energy among body systems and their associated processes.

**Student-Friendly Objectives:**

- I can explain how the body obtains nutrients and how these nutrients are used in structure, function and energy production.
- I can explain how various nutrients are cycled through the body
- I can explain how the mitochondria of each cell produces the energy needed for body function.
- I can explain how different systems use energy.
- I can explain how a deficiency in a nutrient will contribute to a decline in health.

**Learning Indicators of Power Standards**

Students will know... <ul style="list-style-type: none"> <li>• How specific anatomical structures determine specific functions for</li> </ul>	And be able to... <ul style="list-style-type: none"> <li>• Understand how specific cell types build foundations for each body</li> </ul>
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each of the following systems:

- Integumentary System
- Skeletal System
- Muscular System
- Homeostasis begins at the cellular level
- Individual systems will react to maintain homeostasis
- Individual actions of one system will impact actions of another system
- Each system of the body is dependent on energy production (ATP) at the cellular level in order to complete physiological processes
- Each body system requires energy for internal function, repair, building, cell and tissue maintenance and supporting external activities
- The body uses the cycling of matter to obtain necessary nutrients for structure and function and to eliminate waste products

system.

- Use a microscope to identify specific cell types used to build the foundation of each body system.
- Understand the role of specific cells in each body system.
- Create a cellular model to show the role of osmosis in the human body.
- Identify structures on an anatomical model.
- Draw and label structures on an anatomical model.
- Create various models to identify various body regions and structures.
- Manipulate existing models to understand the function of various body systems.
- Create diagrams to show the relationship between structure and function.
- Use dissection to identify important structural components and functions (when applicable) of various body organs:
  - Chicken wing (integumentary, skeletal, muscular)
  - Sheep Brain (Nervous)
  - Pig Heart (Circulatory)
  - Fetal Pig (All systems with focus on digestive, urinary, reproductive)
- Develop a cell membrane model to demonstrate homeostasis and make predictions for cells in multiple environments.
- Utilize digital simulations to predict homeostasis in various conditions.
- Analyze and interpret information from case studies in order to predict the body's response to maintain homeostasis.
- Explain positive and negative feedback loop examples as appropriate for individual body systems.
- Explain how different diseases impact the overall homeostasis of the body.
- Describe how nutrients are derived from various sources (food, water, environment) and utilized in specific structures in order for the system to function.
- Describe how ATP contributes to function at the cellular level.
- Explain how deficiencies in the cycling of matter can impact overall body health.

#### Additional Arkansas State Standards

- **HAP-LS1-1AR Construct an explanation based on evidence obtained from a variety of sources for the pattern of hierarchical organization of each body system:**

- § **Integumentary System**
- § **Skeletal System**
- § **Muscular System**
- **HAP-LS3-1AR** Use mathematics and computational thinking to support explanations for physiological processes in body systems.
- **HAP-LS5-1AR** Argue from evidence the cause(s) for a dysfunction in a body system and the mechanisms by which it occurred.
- **HAP-LS7-1AR** Develop and use a model to illustrate the interactions between systems that control or affect specific functions within the human body.
- **HAP-8-1AR** Obtain, evaluate, and communicate information related to health science professions.
- **HAP-8-2AR** Design a solution to a complex real-world problem affecting body systems that can be solved through engineering.
- **HAP-8-3AR** Evaluate a solution to a complex real-world human health problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

<b>Unit 3</b>	Endocrine/Nervous Systems	<b>Grade Level</b>	10-12	<b>Approx Length</b>	6 weeks
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**CPSD Power Standards with Student Learning Objectives**

**HAP-LS2-1AR** Develop and use a model to identify and describe the relationship between the structures and physiological processes of each body system: Endocrine System and Nervous System

**Student-Friendly Objectives:**

- I can identify and describe the structure and function of various cell types.
- I can use a microscope to identify and illustrate various cell types.
- I can explain how cells are organized to develop tissues, organs and organ systems.
- I can use models to identify structures of specific systems/organs and explain how structure determines function.

**HAP-LS4-1AR** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

**Student-Friendly Objectives:**

- I can use technology to manipulate conditions within the body/environment to predict a response
- I can describe how cells of the body would react to different environments.
- I can predict the body’s response to maintain homeostasis under certain conditions.
- I can distinguish between positive and negative feedback loops and provide examples and explanations of how these loops maintain homeostasis.
- I can identify diseases that impact specific body systems and explain the effects of the disease on homeostasis, both in the system and body.

**HAP-LS6-1AR** Construct and revise an explanation for the cycling of matter and flow of energy among body systems and their associated processes.

**Student-Friendly Objectives:**

- I can explain how the body obtains nutrients and how these nutrients are used in structure, function and energy production.
- I can explain how various nutrients are cycled through the body
- I can explain how the mitochondria of each cell produces the energy needed for body function.
- I can explain how different systems use energy.
- I can explain how a deficiency in a nutrient will contribute to a decline in health.

**Learning Indicators of Power Standards**

Students will know... <ul style="list-style-type: none"> <li>● How specific anatomical structures determine specific functions for</li> </ul>	And be able to... <ul style="list-style-type: none"> <li>● Understand how specific cell types build foundations for each body</li> </ul>
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each of the following systems:

- Endocrine System
- Nervous System
- Homeostasis begins at the cellular level
- Individual systems will react to maintain homeostasis
- Individual actions of one system will impact actions of another system
- Each system of the body is dependent on energy production (ATP) at the cellular level in order to complete physiological processes
- Each body system requires energy for internal function, repair, building, cell and tissue maintenance and supporting external activities
- The body uses the cycling of matter to obtain necessary nutrients for structure and function and to eliminate waste products

system.

- Use a microscope to identify specific cell types used to build the foundation of each body system.
- Understand the role of specific cells in each body system.
- Create a cellular model to show the role of osmosis in the human body.
- Identify structures on an anatomical model.
- Draw and label structures on an anatomical model.
- Create various models to identify various body regions and structures.
- Manipulate existing models to understand the function of various body systems.
- Create diagrams to show the relationship between structure and function.
- Use dissection to identify important structural components and functions (when applicable) of various body organs:
  - Chicken wing (integumentary, skeletal, muscular)
  - Sheep Brain (Nervous)
  - Pig Heart (Circulatory)
  - Fetal Pig (All systems with focus on digestive, urinary, reproductive)
- Develop a cell membrane model to demonstrate homeostasis and make predictions for cells in multiple environments.
- Utilize digital simulations to predict homeostasis in various conditions.
- Analyze and interpret information from case studies in order to predict the body's response to maintain homeostasis.
- Explain positive and negative feedback loop examples as appropriate for individual body systems.
- Explain how different diseases impact the overall homeostasis of the body.
- Describe how nutrients are derived from various sources (food, water, environment) and utilized in specific structures in order for the system to function.
- Describe how ATP contributes to function at the cellular level.
- Explain how deficiencies in the cycling of matter can impact overall body health.

#### Additional Arkansas State Standards

- HAP-LS1-1AR Construct an explanation based on evidence obtained from a variety of sources for the pattern of hierarchical organization of each

**body system:**

- § **Nervous System**
- § **Endocrine System**
- **HAP-LS3-1AR** Use mathematics and computational thinking to support explanations for physiological processes in body systems.
- **HAP-LS5-1AR** Argue from evidence the cause(s) for a dysfunction in a body system and the mechanisms by which it occurred.
- **HAP-LS7-1AR** Develop and use a model to illustrate the interactions between systems that control or affect specific functions within the human body.
- **HAP-8-1AR** Obtain, evaluate, and communicate information related to health science professions.
- **HAP-8-2AR** Design a solution to a complex real-world problem affecting body systems that can be solved through engineering.
- **HAP-8-3AR** Evaluate a solution to a complex real-world human health problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

<b>Unit 4</b>	Circulatory/Respiratory Systems	<b>Grade Level</b>	10-12	<b>Approx Length</b>	7 weeks
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**CPSD Power Standards with Student Learning Objectives**

**HAP-LS2-1AR** Develop and use a model to identify and describe the relationship between the structures and physiological processes of each body system: Circulatory System and Respiratory System

**Student-Friendly Objectives:**

- I can identify and describe the structure and function of various cell types.
- I can use a microscope to identify and illustrate various cell types.
- I can explain how cells are organized to develop tissues, organs and organ systems.
- I can use models to identify structures of specific systems/organs and explain how structure determines function.

**HAP-LS4-1AR** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

**Student-Friendly Objectives:**

- I can use technology to manipulate conditions within the body/environment to predict a response
- I can describe how cells of the body would react to different environments.
- I can predict the body’s response to maintain homeostasis under certain conditions.
- I can distinguish between positive and negative feedback loops and provide examples and explanations of how these loops maintain homeostasis.
- I can identify diseases that impact specific body systems and explain the effects of the disease on homeostasis, both in the system and body.

**HAP-LS6-1AR** Construct and revise an explanation for the cycling of matter and flow of energy among body systems and their associated processes.

**Student-Friendly Objectives:**

- I can explain how the body obtains nutrients and how these nutrients are used in structure, function and energy production.
- I can explain how various nutrients are cycled through the body
- I can explain how the mitochondria of each cell produces the energy needed for body function.
- I can explain how different systems use energy.
- I can explain how a deficiency in a nutrient will contribute to a decline in health.

**Learning Indicators of Power Standards**

Students will know... <ul style="list-style-type: none"> <li>● How specific anatomical structures determine specific functions for</li> </ul>	And be able to... <ul style="list-style-type: none"> <li>● Understand how specific cell types build foundations for each body</li> </ul>
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each of the following systems:

- Circulatory System
- Respiratory System
- Homeostasis begins at the cellular level
- Individual systems will react to maintain homeostasis
- Individual actions of one system will impact actions of another system
- Each system of the body is dependent on energy production (ATP) at the cellular level in order to complete physiological processes
- Each body system requires energy for internal function, repair, building, cell and tissue maintenance and supporting external activities
- The body uses the cycling of matter to obtain necessary nutrients for structure and function and to eliminate waste products

system.

- Use a microscope to identify specific cell types used to build the foundation of each body system.
- Understand the role of specific cells in each body system.
- Create a cellular model to show the role of osmosis in the human body.
- Identify structures on an anatomical model.
- Draw and label structures on an anatomical model.
- Create various models to identify various body regions and structures.
- Manipulate existing models to understand the function of various body systems.
- Create diagrams to show the relationship between structure and function.
- Use dissection to identify important structural components and functions (when applicable) of various body organs:
  - Chicken wing (integumentary, skeletal, muscular)
  - Sheep Brain (Nervous)
  - Pig Heart (Circulatory)
  - Fetal Pig (All systems with focus on digestive, urinary, reproductive)
- Develop a cell membrane model to demonstrate homeostasis and make predictions for cells in multiple environments.
- Utilize digital simulations to predict homeostasis in various conditions.
- Analyze and interpret information from case studies in order to predict the body's response to maintain homeostasis.
- Explain positive and negative feedback loop examples as appropriate for individual body systems.
- Explain how different diseases impact the overall homeostasis of the body.
- Describe how nutrients are derived from various sources (food, water, environment) and utilized in specific structures in order for the system to function.
- Describe how ATP contributes to function at the cellular level.
- Explain how deficiencies in the cycling of matter can impact overall body health.

#### Additional Arkansas State Standards

- HAP-LS1-1AR Construct an explanation based on evidence obtained from a variety of sources for the pattern of hierarchical organization of each

**body system:**

- § **Respiratory System**
- § **Circulatory System**
- **HAP-LS3-1AR** Use mathematics and computational thinking to support explanations for physiological processes in body systems.
- **HAP-LS5-1AR** Argue from evidence the cause(s) for a dysfunction in a body system and the mechanisms by which it occurred.
- **HAP-LS7-1AR** Develop and use a model to illustrate the interactions between systems that control or affect specific functions within the human body.
- **HAP-8-1AR** Obtain, evaluate, and communicate information related to health science professions.
- **HAP-8-2AR** Design a solution to a complex real-world problem affecting body systems that can be solved through engineering.
- **HAP-8-3AR** Evaluate a solution to a complex real-world human health problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

<b>Unit 5</b>	Digestive/Urinary/Reproductive Systems	<b>Grade Level</b>	10-12	<b>Approx Length</b>	9 weeks
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**CPSD Power Standards with Student Learning Objectives**

**HAP-LS2-1AR** Develop and use a model to identify and describe the relationship between the structures and physiological processes of each body system: Digestive System, Urinary System, and Reproductive System

**Student-Friendly Objectives:**

- I can identify and describe the structure and function of various cell types.
- I can use a microscope to identify and illustrate various cell types.
- I can explain how cells are organized to develop tissues, organs and organ systems.
- I can use models to identify structures of specific systems/organs and explain how structure determines function.

**HAP-LS4-1AR** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

**Student-Friendly Objectives:**

- I can use technology to manipulate conditions within the body/environment to predict a response
- I can describe how cells of the body would react to different environments.
- I can predict the body’s response to maintain homeostasis under certain conditions.
- I can distinguish between positive and negative feedback loops and provide examples and explanations of how these loops maintain homeostasis.
- I can identify diseases that impact specific body systems and explain the effects of the disease on homeostasis, both in the system and body.

**HAP-LS6-1AR** Construct and revise an explanation for the cycling of matter and flow of energy among body systems and their associated processes.

**Student-Friendly Objectives:**

- I can explain how the body obtains nutrients and how these nutrients are used in structure, function and energy production.
- I can explain how various nutrients are cycled through the body
- I can explain how the mitochondria of each cell produces the energy needed for body function.
- I can explain how different systems use energy.
- I can explain how a deficiency in a nutrient will contribute to a decline in health.

**Learning Indicators of Power Standards**

Students will know... <ul style="list-style-type: none"> <li>• How specific anatomical structures determine specific functions for</li> </ul>	And be able to... <ul style="list-style-type: none"> <li>• Understand how specific cell types build foundations for each body</li> </ul>
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each of the following systems:

- Digestive System
- Urinary System
- Reproductive System
- Homeostasis begins at the cellular level
- Individual systems will react to maintain homeostasis
- Individual actions of one system will impact actions of another system
- Each system of the body is dependent on energy production (ATP) at the cellular level in order to complete physiological processes
- Each body system requires energy for internal function, repair, building, cell and tissue maintenance and supporting external activities
- The body uses the cycling of matter to obtain necessary nutrients for structure and function and to eliminate waste products

system.

- Use a microscope to identify specific cell types used to build the foundation of each body system.
- Understand the role of specific cells in each body system.
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  - Fetal Pig (All systems with focus on digestive, urinary, reproductive)
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- Utilize digital simulations to predict homeostasis in various conditions.
- Analyze and interpret information from case studies in order to predict the body's response to maintain homeostasis.
- Explain positive and negative feedback loop examples as appropriate for individual body systems.
- Explain how different diseases impact the overall homeostasis of the body.
- Describe how nutrients are derived from various sources (food, water, environment) and utilized in specific structures in order for the system to function.
- Describe how ATP contributes to function at the cellular level.
- Explain how deficiencies in the cycling of matter can impact overall body health.

#### Additional Arkansas State Standards

- HAP-LS1-1AR Construct an explanation based on evidence obtained from a variety of sources for the pattern of hierarchical organization of each

**body system:**

- § **Digestive System**
- § **Urinary System**
- § **Reproductive Systems**
- **HAP-LS3-1AR** Use mathematics and computational thinking to support explanations for physiological processes in body systems.
- **HAP-LS5-1AR** Argue from evidence the cause(s) for a dysfunction in a body system and the mechanisms by which it occurred.
- **HAP-LS7-1AR** Develop and use a model to illustrate the interactions between systems that control or affect specific functions within the human body.
- **HAP-8-1AR** Obtain, evaluate, and communicate information related to health science professions.
- **HAP-8-2AR** Design a solution to a complex real-world problem affecting body systems that can be solved through engineering.
- **HAP-8-3AR** Evaluate a solution to a complex real-world human health problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.