



Module 1 – Foundations of Sustainable Agri-Food Systems & Circular Economy

Instructor Guide Quizzes

Quiz Administration Instructions

1. Quizzes are aligned to each of the three module lessons (A, B, C). Administer them after completing the corresponding lesson or use it as a cumulative exam.
2. Questions are a mix of multiple-choice, short-response, true/false, short-essay, and design-based prompts.
3. Provide students with 20-25 minutes per quiz, depending on question type and depth. Can be tailored depending on how long each presentation takes.
4. Use student responses for formative assessment and discussion prompts in class.
5. Consider a group review of answers after submission to promote peer learning and reinforce content.
6. Lesson A short response and short essay do not have key words to lookout for, making it easier for students to gain points early on. Lesson B and C DO have key words to look out for, and should be more specific and detailed with their answers.

Question-Based Suggestions

1. The short essay questions are optional for the instructor to use and can be administered based on expectations.
2. True or false questions can be bonus questions or a normal question, depending on how much time the instructor has allotted for each quiz.
3. The design question should ideally be a requirement, since it should be encouraged to provide an assignment that can use critical thinking and problem solving, especially at the end of the module.
4. The design question can be an open note activity.
5. If the instructor decides to do a review of answers after submissions, encourage students to explain why incorrect answers were incorrect for participation.

Grading Rubric

Use this expectations rubric to assess short response, short essay, and design-based responses:

Criteria	Exceeds (3 pts)	Meets (2 pts)	Needs Improvement (1 pt)
Content Accuracy	Response demonstrates deep understanding with specific examples and accurate terminology.	Response addresses the question with mostly accurate content.	Response contains inaccuracies or lacks sufficient explanation.
Clarity & Organization	Response is clearly organized and easy to follow.	Response is mostly clear with minor lapses in structure.	Response is disorganized or difficult to interpret.
Use of Evidence/Data	Provides clear evidence or references to concepts discussed in class/maps/resources.	Some supporting detail or evidence is provided.	Little or no supporting evidence included.
Creativity/Insight (for design prompts)	Innovative, thoughtful, and feasible solutions with clear logic.	The solution is appropriate and meets basic requirements.	Lacks originality or feasibility; vague or incomplete solution.

Lesson A Quiz – Why Food Systems Matter – Planetary Boundaries & SDGs

QUIZ LINKS:

[Module 1 Lesson A Quiz - Editor Link](#)

[Module 1 Lesson A Quiz - Responder link](#)

Multiple choice

Select the correct definition of a sustainable food system:

- A. Producing as much food as possible using only synthetic fertilizers and pesticides.
- B. Focusing only on growing cash crops for export without considering local needs.
- C. Delivering nutritious food to sustain and strengthen environmental, economic, and social foundations
- D. Using machines to replace all human labor in food production regardless of environmental impact.

What are the 3 P's (the 3 principles of sustainable food systems)?

- A. People, planet, profit
- B. Power, performance, popularity
- C. Plants, pollution, packaging
- D. Production, processing, pricing

Which of the following is a planetary boundary of Earth that has already been crossed?

- A. Solar energy use
- B. Ocean salinity balance
- C. Mountain elevation levels
- D. Biosphere integrity

What happens if there is an increase in nitrogen and phosphorus on Earth?

- A. Increased crop growth with no side effects
- B. Dead zones and algae booms
- C. Stronger roots in all plants
- D. Cooler ocean temperatures

Why is the “Double the Food” claim not true?

- A. Because food can only be doubled every 50 years, not sooner.
- B. It ignores the fact that technology will make food grow faster automatically.
- C. Because doubling food supply will immediately reduce all hunger worldwide.
- D. It assumes there's no change in waste or diet, and does solve nutrition gaps

_____ forms a roadmap for ending poverty, protecting the planet, and ensuring prosperity and equality by 2030.

- A. Global trade agreements (GTAs)
- B. Universal health protocols (UHPs)
- C. Sustainable development goals (SDGs)
- D. Climate control policies (CCPs)

What is a key driver of overshoot in the planetary boundaries?

- A. Urban architecture
- B. Food systems

- C. Space exploration
- D. Digital technology use

True or False

The number one cause of deforestation & habitat loss is due to food systems/agriculture

True

Short Answer

Briefly explain why cutting waste and shifting diets could be extremely beneficial changes.

Answer should:

- Explain what cutting waste and shifting diets means
- Explain how these changes could benefit the planet
- Be 2-3 sentences long

Sample Answer (Exceeds): Cutting waste means using less food and throwing away less, while shifting diets means eating more plants and less meat. These changes help because they use fewer resources like water and energy, and reduce greenhouse gas emissions. This helps protect the planet and fight climate change.

Short Essay

Define the 3 P's, and why they play a significant role in sustainable food systems.

Requirements:

- Clearly explain each of the 3 P's
- Explain the significance of the 3 P's in sustainable agriculture

Sample Answer (Exceeds): The 3 P's stand for People, Planet, and Profit. People means making sure communities have good health and fair access to food. Planet means protecting the environment by using natural resources carefully. Profit means that farmers and businesses can make money so they can keep working. Together, the 3 P's are important because sustainable food systems need to support people's needs, take care of the Earth, and be financially strong to last over time.

Relevant Vocabulary for short essay/response (Lesson A):

- *Sustainable Food System*
- *People – Planet – Profit (Triple Bottom Line)*
- *Planetary Boundaries*
- *Biosphere Integrity*
- *Greenhouse Gas (GHG) Emissions*
- *Sustainable Development Goals (SDGs)*
- *Deforestation*
- *Nutrient Pollution*
- *Food Security*
- *Circular Economy*

Lesson B Quiz – From Linear to Circular: Rethinking Food Production

QUIZ LINKS:

[Module 1 Lesson B Quiz - Editor Link](#)

[Module 2 Lesson B Quiz - Responder Link](#)

Multiple choice

Which of the following is a correct definition of the linear path of food production

- A. Grow → eat → compost
- B. Take → make → waste
- C. Buy → store → recycle
- D. Plant → harvest → reuse

Circular economy ____ natural systems instead of ____ them.

- A. Destroys, protecting
- B. Ignores, enhancing
- C. Copies, damaging
- D. Regenerates, depleting

What kinds of byproducts can be repurposed into bioplastic or biodiesel?

- A. Sand and gravel
- B. Fruit pulp and cooking oil
- C. Plastic bags and metal cans
- D. Glass bottles and paper cartons

What is a closed loop food system?

- A. Nutrients and materials keep cycling
- B. Food is grown only once and then discarded
- C. All food is imported from other countries
- D. Food production uses only synthetic chemicals

In Sicily's citrus super loop case study, how do they reduce citrus waste and create a closed loop system?

- A. Burning peels for energy without recycling
- B. Throwing peels directly into landfills
- C. Drying and milling peels
- D. Using peels as animal feed without processing

Which of the following is NOT a feature of regenerative farming?

- A. Building soil carbon
- B. Managed grazing
- C. Restoring ecosystems
- D. Using synthetic fertilizers

What is the similarity between agroecology and regenerative agriculture?

- A. Relying only on chemical fertilizers
- B. Nature powered farming
- C. Using machines to replace all labor
- D. Growing only one crop at a time

True or False

Food scraps are waste that have no potential for being reused

False

Short Answer

How does regenerative agriculture improve the health of farmland over time? Use one example from Lesson B to support your answer.

Answer should:

- Describe one example of regenerative agriculture
- Explain how it can improve farmland health
- Be 2-3 sentences long

Sample Answer (Exceeds): Regenerative agriculture improves farmland by using methods that help the soil and environment get better over time. For example, managed grazing moves animals like wild herds do, which helps grasslands grow back stronger. This keeps the soil healthy and helps plants and animals thrive.

Short Essay

In your own words, explain how agroecology applies the ideas of the circular economy to farming. Use at least two examples from Lesson B to show how these practices help create a self-regenerating agricultural system.

Requirements:

- Describe two examples from the Lesson B agroecology topic
- Explain how the circular economy applies to farming
- Be 3-5 sentences long

Sample Answer (Exceeds): Agroecology uses the ideas of the circular economy by turning waste into useful resources on farms. For example, crop rotation and cover crops help protect the soil and add nutrients back, so farmers don't need as many chemicals. Another example is using livestock manure as natural fertilizer, which creates a loop that keeps nutrients in the system. These practices help farms stay healthy and strong over time without wasting resources.

Relevant Vocabulary for short essay/response (Lesson B):

- *Linear Economy*
- *Circular Economy*
- *Agroecology*
- *Regenerative Agriculture*
- *Nutrient Cycling*
- *Biological Cycle*
- *Technical Cycle*
- *By-product*

- *Composting*
- *Waste-to-Resource*

Lesson C Quiz – Paths to Action: Diet, Innovation, Policy

QUIZ LINKS:

[Module 1 Lesson C Quiz - Editor Link](#)

[Module 1 Lesson C Quiz - Responder Link](#)

Multiple choice

What is NOT one of the three interconnected pathways for transforming the food system?

- A. Dietary shift
- B. Urbanization
- C. Innovation
- D. Policy

Which of the following is France's policy?

- A. Supermarkets must donate edible food instead of trashing it
- B. All farms must use only organic seeds
- C. Restaurants must serve only plant-based meals
- D. Grocery stores must label food by carbon footprint

_____ or _____ pricing shifts could make unsustainable choices less profitable and give sustainable products an edge

- A. Water, sunlight
- B. Energy, plastic
- C. Carbon, nitrogen
- D. Labor, transport

Western countries' beef consumption needs to drop by about _____ to avoid catastrophic environmental damage by mid-century.

- A. 30%
- B. 50%
- C. 70%
- D. 90%

By what amount does cattle take up agricultural land?

- A. $\frac{1}{4}$
- B. $\frac{2}{3}$

- C. $\frac{1}{2}$
- D. $\frac{3}{4}$

True or False

Beef has a carbon footprint roughly 10 to 20 times higher per gram of protein than plant proteins.

True

Short Answer

Think of one of the policies discussed in Lesson C. Explain how that policy could help promote smart and sustainable choices

Answer should

- Reference one of the policies mentioned from Lesson C (i.e. smart incentives, food waste targets, food smart cities, regulating toxins)
- Explain some features of that policy that promote a sustainable future
- Be 2-3 sentences long

Sample Answer (Exceeds): One policy from Lesson C is food waste targets, which set goals to reduce how much food gets thrown away. These targets encourage businesses and cities to find better ways to use leftover food, like donating or composting it. By cutting down waste, this policy helps save resources and protect the environment.

Design Prompt

Come up with a business that you would create, which incorporates sustainable food practices and circular designing.

Requirements:

- Create a business references some ideas mentioned from Lesson C
OR
- Create a business with some ideas of your own (does not have to be completely realistic, but should make sense at least!)
- Be 4-5 sentences long

Sample Answer (Exceeds): I would create a business called “GreenCycle Café” that collects leftover coffee grounds and food scraps from local cafes and restaurants. We would use the coffee grounds to grow mushrooms like oyster mushrooms, and the food scraps would go into a bokashi system to create fertilizer for community gardens. We would also turn leftover fryer oil into biodiesel to help power local buses. This way, waste from one business becomes useful for another, reducing trash and helping the environment. It’s a circular business that makes food and energy from what would normally be thrown away.

Relevant Vocabulary for short essay/response (Lesson C):

- *Dietary Shifts*
- *Policy*
- *CO₂e (Carbon Dioxide Equivalent)*
- *Alternative Proteins*
- *Urban Farming*
- *Food-Waste Target*
- *Systems Thinking*
- *Innovation*