Model Tracker Formative Assessment Tool

CHAPTER LEARNING GOAL

Design and argue for a solution to a well-defined problem in a food system using scientific evidence as well as social considerations.

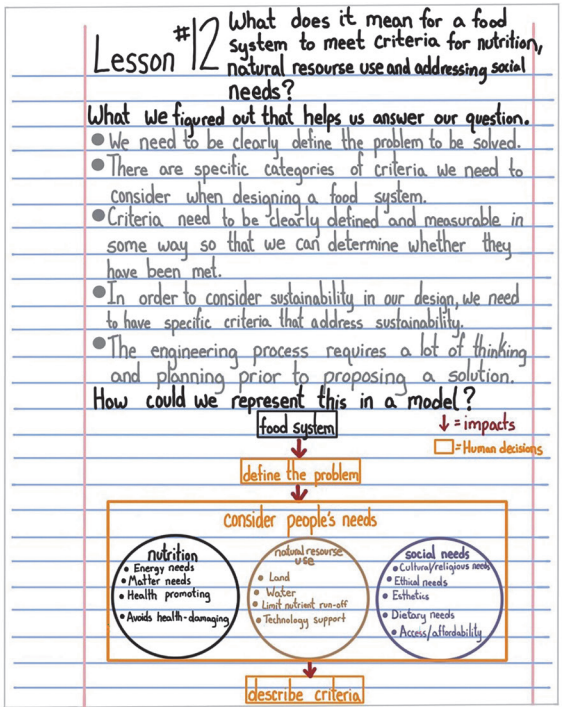
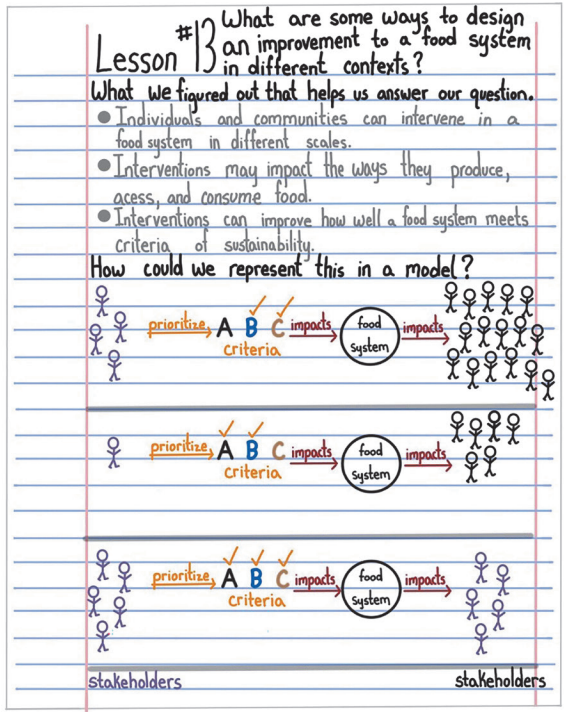
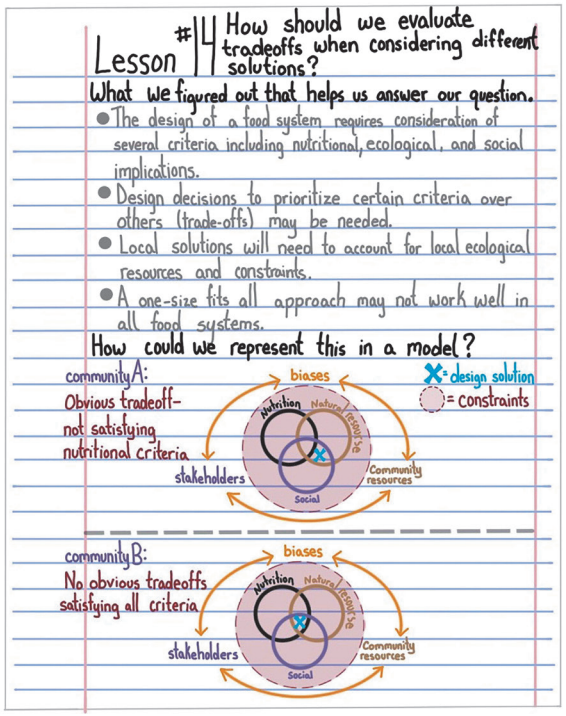
Purpose

In the next lesson (Synthesize), students will use the three models they developed so far to help them contribute ideas to update the Class Consensus Model. Students will then use the Class Consensus Model to construct and support an explanation for how we can design food systems that better meet our nutrition and sustainability goals.

Look across the student entries in the Model Tracker, then use the rubric below to assess individual students' progress over time and their overall readiness to engage with the Synthesize Lesson and, by the end of it, to meet the Chapter Learning Goals.

Model Tracker: Sample Entries

The following table shows the intended list of ideas that students should have figured out in each Investigate Lesson, and one possible way they may choose to represent those ideas. There should be plenty of natural variability in what students write and draw—the Model Trackers are intended to be a record of students' own thinking—***not*** an "ideal" they should memorize or copy down.

Unit 3 Chapter 9 Lesson 12	Unit 3 Chapter 9 Lesson 13	Unit 3 Chapter 9 Lesson 14
		

Formative Assessment and Implications Tracker

The following table is intended to help you identify areas of strength, potential areas for improvement, and any progress over time in the focal DCIs, SEPs, and CCCs. As a formative assessment, it is not intended to be used for scores or grades, but to provide individual students with feedback and to provide you with information about students' readiness for the Synthesize Lesson of this chapter. Remember to look across all the models and consider them together.

Modeling, systems, and DCI criteria																
a. Included the components of a model to show how we can design food systems to better meet our nutrition and stability goals.																
a.1 Stakeholders and their environment	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
a.2 Criteria (Nutrition, Natural Resources, Social Needs)	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
a.3 Constraints	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
a.4 Trade-offs	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
a.5 Design solution	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32

a.6 Impact on the food system	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32

Implications

If students struggle to identify the key components of how we can design food systems to better meet our goals, consider revisiting the following learning opportunities:

- In Lesson 12, criteria are defined and quantified to the extent possible as students identified and created succinct criteria statements relevant to people's social needs for case study design solutions.
- In Lesson 13, students investigate how individuals can intervene in different ways in the way food systems produce, access, and consume foods by closely examining design solutions from different communities including noticing the criteria each solution is prioritizing and the solution impact on stakeholders.
- In Lesson 14, students consider the role of criteria, constraints, and trade-offs when evaluating different design solutions and their potential impact at different levels of scale.

Modeling, systems, and DCI criteria																
b. Showed the interactions between components in the models, which include the **initial conditions, inputs, outputs, and boundaries of systems:**																
b.1 Stakeholders exist within a particular environment that has particular resources.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
b.2 Several criteria contribute to a food system being sustainable including nutritional, resource, and social needs.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
b.3 The criteria that are prioritized and constraints that must be met impact the design solution.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32

b.4 The design solution impacts the food system.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
b.5 The food system impacts the stakeholders.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32

Implications

If students struggle to show the key interactions to explain how we can design food systems to better meet our goals, consider revisiting the following learning opportunities:

- In Lesson 12, students consider different criteria as they grapple with how a food system could be changed to become more sustainable.
- In Lesson 13, students examine several different design solutions that are tailored to specific community needs. Students consider the criteria each group of stakeholders are prioritizing and how the design solution impacts the food system and the stakeholders involved.
- In Lesson 14, students consider the impact of constraints on the choices stakeholders make when they are asked to consider a budget's impact on the choices of yogurt that could be purchased for a community meal.

Modeling, systems, and DCI criteria																
c. Used the models to provide a description of **how the phenomenon works:**																
c.1 The stakeholders' environment influences the decisions they make.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
c.2 Stakeholders consider and make decisions about how criteria will be defined.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32

c.3 Stakeholders make decisions about which criteria to prioritize over others and how constraints will be satisfied.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
c.4 The prioritized criteria are reflected in the design solution.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32
c.5 The design solution has the potential to impact an aspect or aspects of the food system.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32

Implications

If students struggle to use models to explain how we can design food systems to better meet our goals, consider revisiting the following learning opportunities:

- In Lesson 12, students clearly state the criteria used to determine if nutritional, natural resource, and social needs have been met in the design solution and break down those criteria.
- In Lesson 13, students examine several different design solutions and identify the decisions stakeholders made to prioritize specific criteria in their design solutions, and that those decisions can have an impact on the food system and the stakeholders involved.
- In Lesson 14, students consider trade-offs that occur when solution designers make choices about which criteria to prioritize and when there are constraints that limit design choice.

Modeling, systems, and DCI criteria

Progress Over Time

Put a check for progress over time (*or* mastery at the level intended) for this chapter.

d. The Model Tracker shows **progress in ideas over time** (e.g., initially shows a single right design solution, or a solution that does not consider specific criteria but then moves to being explicit about criteria and multiple possible solutions).	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32

e. The Model Tracker shows **progress in the practice of modeling** over time (e.g., at first, including irrelevant components or a misplaced focus on making the model look exactly like the system being modeled; later showing more focus on mechanism and only the components necessary to explain the mechanism).	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**	**S15**	**S16**
	S17	**S18**	**S19**	**S20**	**S21**	**S22**	**S23**	**S24**	**S25**	**S26**	**S27**	**S28**	**S29**	**S30**	**S31**	**S32**
f. The Model Tracker shows **progress in use of the crosscutting concepts of scale, proportion, and quantity and systems and system models** over time (e.g., at first did not clearly represent the boundaries of the system and define the inputs and outputs; at first did not show the significance how a design solution can impact a food system).	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**	**S15**	**S16**
	S17	**S18**	**S19**	**S20**	**S21**	**S22**	**S23**	**S24**	**S25**	**S26**	**S27**	**S28**	**S29**	**S30**	**S31**	**S32**
Implications You may see progress over time or you may see students who had key pieces from the beginning. Either is OK! The point of this section is to see assets in student models and how they are growing.																
Overall Understanding																
g. Based on the presence of the criteria in the rubric, does the student demonstrate understanding of the core ideas, practices, and crosscutting concepts in this chapter so far?	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**	**S15**	**S16**
	S17	**S18**	**S19**	**S20**	**S21**	**S22**	**S23**	**S24**	**S25**	**S26**	**S27**	**S28**	**S29**	**S30**	**S31**	**S32**