

# STUDENT GUIDE

## ENGAGE LESSON 7



### Part 1: Our Motivation

Record what we were trying to figure out that led to this investigation.

- How does the dairy industry influence climate?
- Do cows contribute to climate change?
- What are greenhouse gases? How do they impact climate change?
- What do cows have to do with climate change?



### Part 2: Observing the Investigative Phenomena

Record what you observe about cows and climate in the video.

- The farmer said that the cows impact the climate more than the factory.
- The cow burps release methane.
- They wanted to reduce the greenhouse gas emissions from milk production.





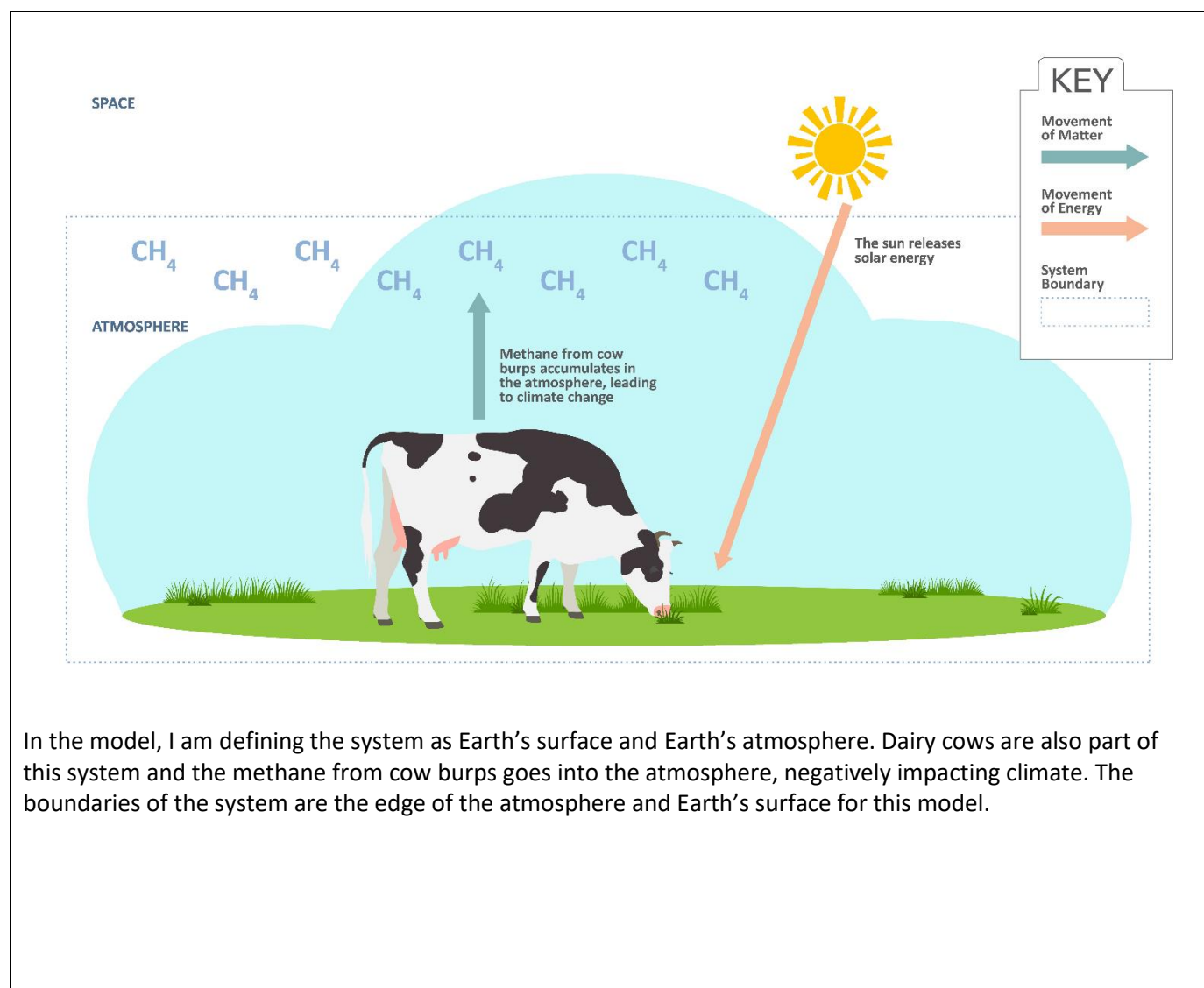
### Part 3: Creating an Initial Model

Create an initial model that shows how you would currently answer our Module Question, “How could cow burps be influencing climate change?” In your model, be sure to utilize images, icons, and pictures to visually represent what is happening in the atmosphere.

Be sure to describe:

- How you are defining your system and its boundaries.
- How you think methane from cow burps influences climate.

Draw a copy of your model in the space below.

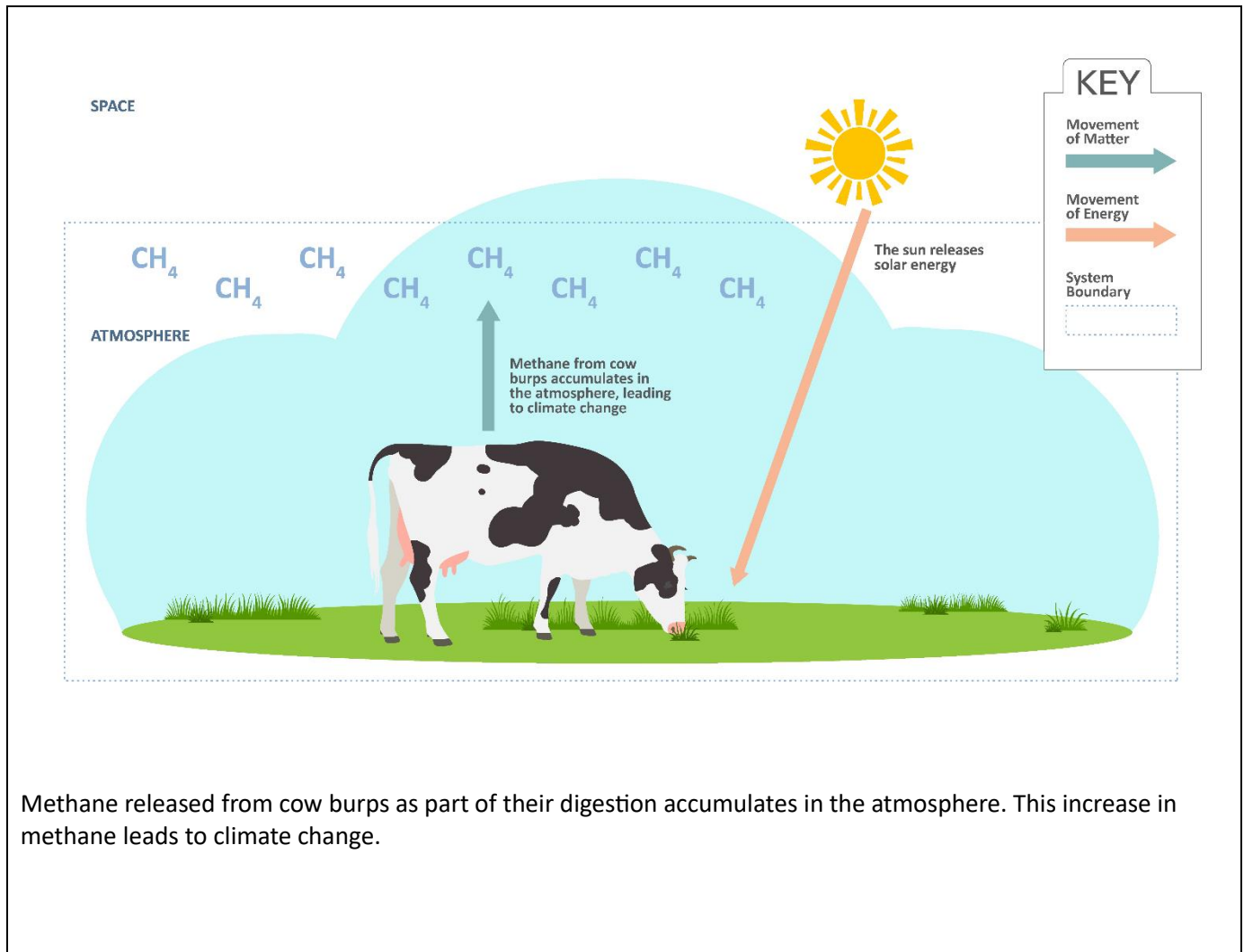


### Part 4: Sharing Initial Models

Share your model with the class as instructed by your teacher. In the space below, reflect on the models of your peers. Record what you agree with and what you disagree with.

Agree	Disagree
I agree with ____ that cows emit methane into the atmosphere. This was explained in the video.	I disagree with ____ that cows emit large amounts of greenhouse gases. I think it is much smaller.

Be ready to share what you found with the class. Record our Class Consensus Model in the space below.



What are gaps in our class model that you want to figure out more about?

- What do greenhouse gases in the atmosphere have to do with climate change?
- What **does** the methane do when it goes into the atmosphere?
- How is methane similar to or different than other greenhouse gases?



## Part 5: Asking New Questions

Record new questions you have that might help you:

- Find additional information about how the dairy system impacts the environment.
- “Fill in a gap” in your model or our class model.
- Settle an area of disagreement that we’ve identified in our models.

- What does a greenhouse gas do to cause climate change? Why do we care about them?
- Is methane the only greenhouse gas that impacts climate?
- Are the claims about greenhouse gas emissions from the dairy food system accurate?
- Are there additional greenhouse gas emissions from other components in the dairy food system that contribute to climate change?
- Where do the greenhouse gas emissions go once released from the cow burps?
- What other man-made production systems emit greenhouse gases?
- How do emissions from the dairy food system compare to emissions from other industries? How does their impact compare?