

STUDENT GUIDE

ELABORATE 1 LESSON 12



Part 1: Our Motivation

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

We are wondering how the amount of greenhouse gases that are emitted from the dairy industry compares to those of other industries.

Questions that led to this investigation are:

- How does the amount of greenhouse gasses compare to the role played by other human-designed systems?
- Does the dairy system have higher or lower emissions than production of other resources?
- Is the dairy industry contributing to climate change more than other industries?



Part 2: Develop an Initial Argument About Greenhouse Gas Emissions Across Sectors

Does dairy production emit more, similar, or less greenhouse gases compared to other industries? Share your initial argument in the space below.

The dairy industry emits less greenhouse gases than other individual industries. I think that it does not contribute to the greenhouse effect the same as industries like transportation and energy.



Part 3: Analyzing Data on the Greenhouse Gas Emissions by Industrial Sector

Analyze the Greenhouse Gas Emissions by Sector data and share what you notice about the quantity of emissions from the dairy industry and how they compare to those from other industries.

Data Source	Notes on Quantity of Emissions of Dairy vs Other Industries
Dairy Industry Emissions Data	Milk production, processing, and transport accounts for 2.7% of total GHG emissions in 2007. This means that nearly 97% of GHG emissions are coming from other industries outside of dairy. Most of a dairy's energy use and GHG emissions come from transporting from farm to dairy, processing, packaging, and transporting dairy to retail markets.
EPA Emissions Data by Sector	Greenhouse gas emissions in agriculture have increased 7.2% from 1990-2020, but have remained relatively steady compared to other economic sectors. Sectors such as transportation, electric power, and industry have all increased by more than 10% since 1990 (18.6%, 15.7%, and 11.3% respectively). Overall, gross total emissions of greenhouse gases in the U.S. has decreased by 2.3%.
Our World in Data Emissions by Sector	Agriculture, forestry, and land use are responsible for 18.4% but have remained relatively constant at around 6 billion tons. Methane emissions by agriculture have increased, but have seemed to level off as of 2020.



Part 4: Revising Initial Arguments Using Evidence

Use the new evidence you have gained to record a new argument that answers the question: "Does dairy production emit more, similar, or less greenhouse gases compared to other industries?" In your argument, be sure to include:

- A claim that answers the questions above.
- At least two pieces of evidence to support your claim.

The dairy industry emits less greenhouse gases than other individual industries. We can see in the Dairy Industry Emissions Data that milk production, processing, and transport accounts for 2.7% of total GHG emissions in 2007. This means that nearly 97% of GHG emissions are coming from other industries outside of dairy. Furthermore, the greenhouse gas emissions of sectors such as transportation, electric power, and industry have all increased by more than 10% since 1990 (18.6%, 15.7%, and 11.3% respectively), but greenhouse gas emissions by all agricultural industries have increased only 7.2%. Lastly, according to Our World in Data, methane emissions by agriculture have increased, but have seemed to level off as of 2020.

