

## CHAIN OF EVENTS FOR PRODUCING REFRIGERANTS

### Performance Standard (15A/15B/15C/16CUS).H

Add real events to a chart displaying a likely chain of events starting with low prices for resources accordingly:

- *Knowledge:* identify events that show a chain of events from resources to sales.
- *Reasoning:* analyze the events and explain why they occurred using appropriate economic reasoning.
- *Communication:* complete a chart that is well organized and well detailed; express all ideas in a way that provides evidence of knowledge and reasoning processes.

### Procedures

1. ***In order to understand economic systems, with an emphasis on the United States (15A); understand that scarcity necessitates choices by consumers (15B); understand that scarcity necessitates choices by producers (15C); and understand the development of economic systems (16CUS),*** provide students with sufficient learning opportunities to develop the following skills:

- Explain how the price of productive resources in a market economy would influence producer decisions about how, how much and what to produce.
- Explain why, as the market price of a good or service goes up, the quantity demanded by consumers goes down.
- Explain why, as the market price of a good or service goes up, the quantity supplied also goes up.
- Explain how entrepreneurs organized their businesses and influenced government to limit competition and maximize profits.

Economic systems are greatly impacted by supply and demand issues that impact both the producer and the supplier. To be successful consumers as well as producers, these skills impact all workers throughout life. Therefore, heating, ventilation, air conditioning and refrigeration (HVACR) students need to be taught the economic concepts of the law of supply and the law of demand and how that relates to production and sales. Students also need to be taught or review the events leading to the development of refrigerant production and distribution. This assessment addresses Illinois Workplace Skill E1 (Interpreting the Economics of Work/Identify the role of business in the economic system).

2. Have HVACR students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. HVACR students will relate the chain of events to the manufacture, distribution and sale of refrigerants. Students will complete the questions on the “Refrigerant Resources to Sales: A Chain of Events” task sheet as related to a common refrigerant such as R22 or R134a.
4. Using sources of information on refrigerants, students should use the center columns of the sheet to describe events that correspond to the points on the chart.
5. Have students use the column, Economic Reasoning, to explain why the events occurred.
6. Evaluate each student’s work using the Social Science Rubric as follows, and add the scores to determine the performance level:
  - *Knowledge:* The identification of the events that correspond to the points on the chart is complete and accurate.
  - *Reasoning:* The analysis in the Economic Reasoning column makes a clear connect with the events and is appropriate, logical and well reasoned.
  - *Communication:* The chart is well organized and well detailed; the knowledge and reasoning were completely and effectively communicated.

### Examples of Student Work

- [Meets](#)
- [Exceeds](#)

### Time Requirements

- One, 50-minute period to gather information
- One, 50-minute period to make chart

### Resources

- Economics textbook
- Refrigerant Resources to Sales: A Chain of Events worksheet
- Social Science Rubric

## REFRIGERANT RESOURCES TO SALES: A CHAIN OF EVENTS

CHAIN OF EVENTS	COMMONLY USED REFRIGERANTS	ECONOMIC REASONING
1. Resources for a particular refrigerant (R22, R134A OR R410) are found in great abundance and are easily accessible.		
2. Inexpensive transportation is available to take the resources to where needed.		
3. Low prices for resources and efficient production lowers price of refrigerant leading to increase in sales.		
4. Entrepreneur determines that prices for resources are low enough to allow the production of refrigerant below market price allowing a profit.		
5. The opportunity for profit draws investment money to pay the costs of refrigerant production.		
6. Desire to increase potential profit leads to use of more efficient processes for producing common refrigerants.		

## SOCIAL SCIENCE RUBRIC

NAME \_\_\_\_\_ DATE \_\_\_\_\_

- Exceeds standard (total points 11 - 12)                       Approaches standard (total points 5 - 7)  
 Meets standard (total points 8 - 10)                               Begins standard or absent (total points 1 - 4)

	<b>Knowledge</b> of evidence from the social sciences: facts/supporting details; themes/issues; and concepts/ideas	<b>Reasoning:</b> Analysis, evaluation and synthesis of evidence	<b>Communication:</b> Demonstrates knowledge and reasoning through oral, written, visual, dramatic or mixed media presentation
<b>4</b>	<ul style="list-style-type: none"> <li>• Key concepts/themes/issues/ideas are thoroughly identified, defined and described.</li> <li>• Significant facts/supporting details are included and accurately described.</li> <li>• Has little or no factual inaccuracies.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies and logically organizes almost all relevant evidence.</li> <li>• Uses appropriate and comprehensive critical thinking skills and habits of mind to analyze, evaluate and synthesize evidence.</li> <li>• Reaches informed conclusions based on the evidence.</li> </ul>	<ul style="list-style-type: none"> <li>• Almost all ideas in the presentation are expressed in a way that provides evidence of the student's knowledge and reasoning processes.</li> <li>• The presentation is well focused with a well-defined thesis.</li> <li>• Presentation shows substantial evidence of organization.</li> <li>• Presentation shows attention to the details of specific performance conventions.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• Key concepts/themes/issues/ideas are identified, defined and described.</li> <li>• Facts/supporting details are included.</li> <li>• May have a major factual inaccuracy, but most information is correct.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies and organizes most of the relevant evidence.</li> <li>• Uses partial critical thinking skills and habits of mind to analyze, evaluate and synthesize evidence.</li> <li>• Reaches informed conclusions based on the evidence.</li> </ul>	<ul style="list-style-type: none"> <li>• Most ideas in the presentation are expressed in a way that provides evidence of the student's knowledge and reasoning processes.</li> <li>• The presentation demonstrates a focus and thesis with several narrative gaps.</li> <li>• Presentation demonstrates adequate evidence of organization.</li> <li>• Presentation has mistakes in attention to the details of specific performance conventions.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• Some key concepts/themes/issues/ideas are identified, defined and described.</li> <li>• Some facts/supporting details are included.</li> <li>• Has some correct and some incorrect information.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies some relevant evidence and omits most of the other evidence.</li> <li>• Uses unclear, inappropriate or incomplete critical thinking skills and habits of mind to analyze, evaluate and synthesize evidence.</li> <li>• Reaches incomplete or inaccurate conclusions based on the evidence.</li> </ul>	<ul style="list-style-type: none"> <li>• Some ideas in the presentation are expressed in a way that provides evidence of the student's knowledge and reasoning processes.</li> <li>• The presentation demonstrates an inadequate focus and thesis.</li> <li>• Presentation demonstrates inadequate evidence of organization.</li> <li>• Presentation has insufficient attention to the details of specific performance conventions.</li> </ul>
<b>1</b>	<ul style="list-style-type: none"> <li>• Few or no key concepts/themes/issues/ideas are identified, defined and described.</li> <li>• Few or no facts/supporting details are included.</li> <li>• Information is largely inaccurate, absent or irrelevant.</li> </ul>	<ul style="list-style-type: none"> <li>• Important evidence relevant to the problem is not identified.</li> <li>• Critical thinking skills and habits of mind are absent.</li> <li>• Conclusions are lacking, absent or unclear.</li> </ul>	<ul style="list-style-type: none"> <li>• Expression of almost all ideas in the presentation is unclear.</li> <li>• The presentation demonstrates little focus and lacks a thesis.</li> <li>• Presentation demonstrates little or no evidence of organization.</li> <li>• Presentation has multiple mistakes in attention to the details of specific performance conventions.</li> </ul>
<b>Score</b>			