Buy Vs. Lease Lab

Math Concept(s): Linear Systems

Source / Text:

Developed by: Jeremy Torres E-Mail: torresf@issaquah.wednet.edu

Date: Summer Conference 2023

Attach the following documents:

- Lab Instructions: (See attached)
- Student Handout(s)
- Rubric and/or Assessment Tool

Short Description (Be sure to include where in your instruction this lab takes place):

Students will select either a car or residence to look up the price to purchase an older car/residence outright or lease a new car/residence. They will compare the pros/cons of both.

Lab Plan

Lab Title: Do we Buy or Do We Lease?

Prerequisite skills: Ability to use Google, understand slope-intercept form, and be able to graph.

Lab objective: Get students involved in real-world applications of systems of equations.

Standards: *(Note SPECIFIC relationship to Science, Technology, and/or Engineering)*

Mathematics K–12 Learning Standards:

- HSA-CED.A.1, HSA-CED.A.2, HSA-CED.A.3, HSA-CED.A.4, HSA-REI.C.6

Standards for Mathematical Practice:

- MP1, MP3, MP4

K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):

- Speaking and Listening. Comprehension and Collaboration.
- Work with peers to set rules for collegial discussions and decision making.
- Propel conversations by posing and responding to questions that relate to current information.

Technology

- Using technology to do research on their chosen product.
- Use technology to create the graphs for the system. (If chosen)

Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)

☐ Global Awareness ☒ Financial/Economic/Business/Entrepreneurial Literacy ☐ Civic Literacy
☐ Health/Safety Literacy ☐ Environmental Literacy

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATION
Creativity and Innovation
☒ Think Creatively
☒ Work Creatively with Others
☐ Implement Innovations
Critical Thinking and Problem Solving
☒ Reason Effectively
☐ Use Systems Thinking
☐ Make Judgments and Decisions
☒ Solve Problems
Communication and Collaboration
☒ Communicate Clearly
☒ Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS
Information Literacy
☒ Access and Evaluate Information
☒ Use and manage Information
Media Literacy
☐ Analyze Media
☐ Create Media Products
Information, Communications and Technology (ICT Literacy)
☒ Apply Technology Effectively

LIFE & CAREER SKILLS
Flexibility and Adaptability
☐ Adapt to Change
☐ Be Flexible
Initiative and Self-Direction
☒ Manage Goals and Time
☐ Work Independently
☐ Be Self-Directed Learners
Social and Cross-Cultural
☒ Interact Effectively with Others
☒ Work Effectively in Diverse Teams

Productivity and Accountability
☐ Manage Projects
☒ Produce Results
Leadership and Responsibility
☒ Guide and Lead Others
☒ Be Responsible to Others

Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Research materials i.e., books, laptops, cell phones etc.

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

- Think Creatively, Reason Effectively, Access and Evaluate Information, Produce Results, and Be Responsible to Others.

Cooperative Learning:

- Work Creatively with Others, Communicate Clearly, Collaborate with Others, Apply Technology Effectively, Manage Goals and Time, Interact Effectively with Others, Work Effectively in Diverse Teams, and Guide and Lead.

Expectations:

- Students will work collaboratively with each other in doing research on their selected product. They will produce a graph comparing buying vs. leasing of the product. They will need to show/solve for the point of intersection and interpret that point.

Timeline:

- Students will be given one full week of school to complete. There will be a “mid-point” check-in to see if more time is needed.

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab.

- How is understanding linear systems helpful in the real world?
- Do the equations take everything into account? If not what else needs to be discussed?

Optional or Extension Activities

- Do the other linear system of the other product. (Car or Residence)
- Create a simple monthly budget for their decision to purchase or lease. Also take into account other expenditures; cell phone, internet, water/sewer/garbage, power, etc.

Buy Vs. Lease

Directions: You are to create a visual and mathematical representation comparing buying/leasing. This project can be done solo or in groups of two.

- **Choose whether you are going to compare buying an older car with leasing a new car or buying a house or leasing a comparable one.**
- **Research the type of item you've chosen. Remember that your new car must be the recent model of the older, or the house you buy/lease must have the same number of beds/baths, etc.**
- **If you are in a group of two one of you will do the car and the other will do the residence.**
- **You will need to use the pertinent information to create linear equations, one for leasing and one for purchasing, for your product.**
- **Graph the leasing and purchasing equations on the same graph. Done either by hand or electronically.**
- **Find the point of intersection and denote what this point means within your scenario.**
- **Based on your research, should you purchase or lease your product.**

Category	Points Possible	Points
Accuracy of Research	5	
Graph (Neatness, Accuracy, Presentation)	10	
Point of Intersection Explanation	5	
Result Write Up	10	
Evidence of Effort	5	
	Total	___/35

Category	Points Possible	Points
Accuracy of Research	5	
Graph (Neatness, Accuracy, Presentation)	10	
Point of Intersection Explanation	5	
Result Write Up	10	
Evidence of Effort	5	
	Total	0/35