Drying Costs Debate

Compare energy use and costs before recommending a change.

PHS.5.8 "Research the efficiency of everyday machines and debate ways to improve their economic impact on society (e.g., electrical appliances, transportation vehicles)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline evidence about electricity use, circle costs or savings, and number two tradeoffs that could affect a community decision.

What Does a Dry Load Cost?

1. A family replaces a worn-out electric dryer. A standard resistance dryer heats air with an electric coil and vents warm, moist air outside. A heat-pump dryer reuses heat as it removes moisture. Both dry a similar load, so using fewer kilowatt-hours per load means getting the same service with less electricity. The figures below are illustrative, not product ratings.

ILLUSTRATIVE COSTS FOR DRYING 200 LOADS PER YEAR

Drying method	Electricity per load	Yearly electricity cost	Initial cost
Resistance dryer	3.0 kWh	$120	$600
Heat-pump dryer	1.5 kWh	$60	$1,100
Outdoor clothesline	0 kWh	$0	$40

2. For 200 loads a year at $0.20 per kilowatt-hour, the heat-pump dryer saves $60 in electricity yearly compared with the resistance model. Its $500 higher purchase price takes about 8.3 years to recover through those savings, assuming prices and performance stay fixed. Repairs and changes in electricity prices could shift that estimate.

3. A clothesline uses no electricity to dry a load, but rain, limited outdoor space, and extra time can make it impractical. A community rebate on heat-pump dryers could lower the cost barrier, yet someone must fund it. To judge the policy, weigh household savings, upfront costs, and how lower electricity demand may reduce the need for power generation.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does the heat-pump dryer provide the same drying service with less electricity than the resistance dryer? Use the per-load figures.

2. Why would the heat-pump dryer take about 8.3 years to recover its higher purchase price under the passage's assumptions?

3. Compared with the resistance dryer, what is one financial advantage of the clothesline, and what could limit its use?

4. Should a community consider a rebate on heat-pump dryers? Give one benefit and one economic concern supported by the passage.

3 YOUR TURN

Your own words

Propose a way for a local housing group to reduce the electricity cost of drying clothes without buying new dryers or offering a rebate. In 3 to 4 sentences, use at least one figure from the table, explain a financial benefit and a limitation, and name information you would research before recommending your idea.

ANSWER KEY

Drying Costs Debate

HIGH SCHOOL · PHS.5.8

PART 1 · READ AND MARK

Underline evidence about electricity use, circle costs or savings, and number two tradeoffs that could affect a community decision. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does the heat-pump dryer provide the same drying service with less electricity than the resistance dryer? Use the per-load figures.	**It dries a similar load using 1.5 kWh instead of 3.0 kWh, so it uses 1.5 kWh less per load.**
2	Why would the heat-pump dryer take about 8.3 years to recover its higher purchase price under the passage's assumptions?	**It costs $500 more initially and saves $60 per year in electricity. $500 divided by $60 per year is about 8.3 years.**
3	Compared with the resistance dryer, what is one financial advantage of the clothesline, and what could limit its use?	**The clothesline has a lower initial cost and could avoid up to $120 in yearly electricity costs. Rain, limited space, or extra time could limit its use.**
4	Should a community consider a rebate on heat-pump dryers? Give one benefit and one economic concern supported by the passage.	**A rebate could help households afford dryers that save $60 a year in electricity, but the community would need to fund the rebate.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would suggest a shared outdoor clothesline for apartment residents. Each load moved from the resistance dryer to the clothesline could avoid 3.0 kWh of electricity, worth $0.60 at the stated rate. Rain and limited outdoor space could restrict its use, and installing it would cost money. I would research installation costs and how many loads residents could actually dry outside.

Accept reasoned positions on the rebate if students support both the benefit and the funding concern. For the open task, accept other feasible changes that use a table figure accurately and identify a limitation and a research need.