Power Beyond Fossils

Evaluate energy advances and build a practical plan

E.8.10.1 "Read and evaluate scientific information about advancements in renewable and nonrenewable resources. Propose and defend ways to decrease national and global dependency on nonrenewable resources."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two energy advancements, circle two limits to their use, and number three actions that could reduce fossil fuel use. Use your marks to weigh which actions work well together.

Keeping Schools Warm Without Fossil Fuels

1 On a winter morning, a school may need heat before sunrise, when rooftop solar panels produce no electricity. Many schools burn natural gas for heat, and power plants may burn gas or coal to supply electricity. These fuels are nonrenewable because they form far more slowly than people use them. Newer heat pumps move heat instead of making it by burning fuel. They can use less energy than electric resistance heaters, but their electricity must still come from somewhere. Replacing a gas furnace does not automatically end fossil fuel use.

2 At noon, improved solar panels can make electricity on a school's roof, even on cool days. A battery can store some of that electricity for use after sunset. Yet batteries hold a limited amount, and making them requires mined materials. In a long, cloudy stretch, a school may still need power from the wider grid. Insulation and sealed windows lower the amount of energy needed for heating. Together, these changes can cut gas use more reliably than adding solar panels alone, because using less energy makes stored power last longer.

3 One school cannot change a country's fuel supply by itself. If many districts improve buildings and buy clean electricity, demand for gas and coal can fall nationwide. A country can also share reliable grid designs and battery-recycling methods with others. Countries differ in sunlight, money, and access to materials, so copying one plan everywhere may fail. Leaders must check whether clean electricity is available when heat is needed and whether old batteries can be handled safely. A strong proposal combines energy savings, renewable power, and a backup plan for hard days.

2 ANSWER WITH EVIDENCE

Use the passage

1. A school replaces its gas furnace with a heat pump. Why might this change fail to end the school's fossil fuel use?

2. A school claims that solar panels and a battery mean it will never need the wider grid. Evaluate this claim using two limits from the passage.

3. Why might insulation and sealed windows make a solar-and-battery plan more effective?

4. Should every country copy the same clean-energy plan? Defend your answer with two differences named in the passage.

3 YOUR TURN

Your own words

A cold, often cloudy town wants to cut fossil fuel use at its clinic and refrigerated food store. In 4 to 5 sentences, propose a plan with two energy advancements and one energy-saving action from the passage, address one limit, and use two facts from the passage to defend how your plan could reduce national or global dependence on nonrenewable fuels.

ANSWER KEY

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GRADE 8 · E.8.10.1

PART 1 · READ AND MARK

Underline two energy advancements, circle two limits to their use, and number three actions that could reduce fossil fuel use. Use your marks to weigh which actions work well together. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	A school replaces its gas furnace with a heat pump. Why might this change fail to end the school's fossil fuel use?	**The heat pump needs electricity, which may come from a power plant that burns gas or coal.**
2	A school claims that solar panels and a battery mean it will never need the wider grid. Evaluate this claim using two limits from the passage.	**The claim is not supported. Batteries store only a limited amount, and a long, cloudy stretch may leave the school needing power from the wider grid.**
3	Why might insulation and sealed windows make a solar-and-battery plan more effective?	**They lower the energy needed for heating, so stored power lasts longer and the school can cut more gas use.**
4	Should every country copy the same clean-energy plan? Defend your answer with two differences named in the passage.	**No. Countries differ in sunlight, money, and access to materials, so a plan that works in one country may not work in another.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would install heat pumps at the clinic and solar panels on both roofs, while sealing windows to lower heating demand. Heat pumps move heat without burning gas at the buildings, and solar panels make electricity even on cool days. Because clouds and nights limit solar power, the clinic would keep a connection to the wider grid for backup. Sealed windows would reduce demand, making stored power last longer if the town later adds a battery. If towns across the country made similar changes and bought clean grid electricity, they could reduce nationwide demand for gas and coal.

Accept different practical plans that include two passage-based advancements, an energy-saving action, a limit with a response, and two accurate passage facts supporting a national or global effect. Plans should not claim that a heat pump eliminates fossil fuel use when its electricity comes from fossil fuels.