Polymer disposal: evaluate the options

Student activity • observation and reasoning

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The question

What information makes a disposal claim credible?

Compare reuse, recycling, landfill and controlled energy recovery using a defined plastic item. Explain environmental consequences without burning plastic in class.

Equipment

- Booklet, pencil, periodic table and optional molecular model kit

Desk activity only; keep small model pieces away from mouths.

Course coverage: Shared core: 4.47. Persistence and harmful emissions from burning addition polymers.

Plan, model or apparatus sketch

Draw a labelled structure or model to explain your reasoning for this lesson.

Method and reasoning

Read the whole sequence before starting

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1. Choose a clean labelled poly(ethene) packaging example or its photograph.

2. Explain why ordinary addition-polymer chains resist biodegradation and can accumulate.

3. Compare reuse and mechanical recycling, including sorting/contamination limitations.

4. Evaluate landfill as containment that does not destroy the polymer.

5. Explain why uncontrolled burning can produce CO, smoke and harmful products; chlorine-containing polymers can release acidic HCl.

6. Write a recommendation conditional on local collection facilities and product composition, avoiding an unsupported universally-best claim.

Cleanup

• Return shared equipment and retain corrected reasoning.

Record your evidence

Blank spaces are for your own work

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Reference and task data

No local recycling acceptance list or emissions dataset is supplied. Evaluate the stated options conditionally. Controlled industrial combustion requires emissions management; open burning is not an acceptable classroom investigation.

Option	Benefit / evidence	Limitation
Reuse / recycling		
Landfill		
Controlled energy recovery		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Why can addition plastics persist?

2. Give one recycling limitation.

3. Does landfill make the polymer biodegrade?

4. Name two hazards of uncontrolled burning.

5. Why does polymer identity matter?

6. Give a justified conditional recommendation.