DNA on Trial

Weigh forensic benefits against privacy risks

BIO.3C.4 "Research and identify how DNA technology benefits society. Engage in scientific argument from evidence over the ethical issues surrounding the use of DNA technology (e.g., cloning, transgenic organisms, stem cell research..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two benefits of DNA profiling and circle two limits on what a profile can prove. Write 1 beside one privacy concern and 2 beside one proposed safeguard to help you weigh the council's choice.

What Can a DNA Profile Tell Us?

1. After a break-in at a neighborhood pharmacy, investigators find a blood drop on a broken window. A laboratory can make a DNA profile by measuring selected short repeating sections of DNA, called STRs. The lengths of these sections vary among people, so a combination of many STR results can help distinguish individuals. A lab compares the evidence profile with a profile from a person who agrees to provide a cheek swab. If the profiles do not match, that person can be excluded as the source of the blood. A match can guide an investigation, but it cannot show when or why the blood was left.

2. Years later, stored crime-scene DNA can also be tested when older cases are reopened. If a reliable evidence profile excludes a convicted person, that result can help overturn a wrongful conviction. A matching profile needs more careful interpretation. Investigators may estimate how rare that profile is in a population, but even a rare match does not prove that someone committed a crime. Samples can be contaminated, and DNA can move between surfaces through contact. Investigators must check how a sample was collected and consider other evidence, such as a witness account or a record of who entered the building.

3. A city council considers storing DNA profiles from everyone arrested, even if they are never charged. Supporters say a larger database could speed comparisons with future crime-scene samples and help clear people wrongly suspected. Critics note that arrest is not proof of guilt and that storage without consent threatens privacy. A profile made from selected STRs is not a complete genome or a medical diagnosis, but comparisons can reveal biological relationships. One proposal allows searches only for serious crimes and requires deleting profiles from people who are not charged or are acquitted. The council must weigh possible benefits against privacy costs.

2 ANSWER WITH EVIDENCE

Use the passage

1. How could DNA profiling help someone wrongly suspected of the pharmacy break-in? Use a detail about STR profiles as evidence.

2. A council member says a rare profile match proves a person committed a crime. Use two details from the passage to challenge that claim.

3. Someone argues that storing STR profiles cannot threaten privacy because they are not complete genomes. What evidence from the passage challenges that argument?

4. Would the council's proposed search and deletion rules preserve a benefit of DNA profiling while reducing an ethical risk? Support both parts of your answer with passage evidence.

3 YOUR TURN

Your own words

After a flood, a county proposes a voluntary DNA-profile database to help identify missing people using relatives' samples. In five or six sentences, recommend rules for the database using two scientific details from the passage, one likely benefit, one ethical risk, and one safeguard; explain why a match alone is not proof of identity.

ANSWER KEY

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PART 1 · READ AND MARK

Underline two benefits of DNA profiling and circle two limits on what a profile can prove. Write 1 beside one privacy concern and 2 beside one proposed safeguard to help you weigh the council's choice. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How could DNA profiling help someone wrongly suspected of the pharmacy break-in? Use a detail about STR profiles as evidence.	**Many STR results help distinguish people. If the person's profile does not match the blood profile, investigators can exclude that person as its source.**
2	A council member says a rare profile match proves a person committed a crime. Use two details from the passage to challenge that claim.	**DNA can move between surfaces, so a match does not show when or why it was left. Samples can also be contaminated.**
3	Someone argues that storing STR profiles cannot threaten privacy because they are not complete genomes. What evidence from the passage challenges that argument?	**Comparisons of STR profiles can reveal biological relationships, even though the profiles are not complete genomes.**
4	Would the council's proposed search and deletion rules preserve a benefit of DNA profiling while reducing an ethical risk? Support both parts of your answer with passage evidence.	**Yes. Searches for serious crimes could still compare evidence profiles to help investigations, while deleting profiles from people not charged or acquitted would reduce storage without consent.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would allow relatives to volunteer DNA profiles to help identify missing people after the flood. Comparing many STR sections could narrow possible identities because their lengths vary among people. Profiles can also reveal biological relationships, so relatives' samples may help investigators find a possible match. However, a match alone cannot confirm identity because samples can be contaminated. Keeping relatives' profiles indefinitely could expose private family information. The county should require consent, restrict searches to missing-person cases, check other evidence, and delete profiles when the search ends.

Accept other evidence-based positions on the council's rules if students address both an investigative benefit and a privacy risk. For the flood proposal, look for two accurate scientific details and a safeguard that responds to the stated risk.