

Bits Under Pressure

Evaluate benefits and risks of digital information systems.

HS-PS4-2 "Evaluate questions about the advantages of using a digital transmission and storage of information. Clarification Statement: Examples of advantages could include that digital information is stable because it can be stored reliably in..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each claim about a benefit or risk of digital information. Circle the concrete detail that supports each claim.

Creek Data on the Move

- ① After a creek overflowed near Riverton High School, students used water-level sensors to send measurements to a shared online map. Each sensor changed its measurement into digital data, a pattern of bits that computers can store and transmit. The map updated as new readings arrived, so the emergency team could view the same information at the school and at city hall. Digital files can be copied without the gradual noise that may build up when an analog signal is copied repeatedly. This made it practical for several people to examine matching data quickly.
- ② The team saved the readings in computer memory and made backup copies on a separate server. If one laptop failed, the data could still be recovered from a backup. A digital file can remain unchanged during storage when its bits are kept accurately, which supports reliable long-term records. Sending the file over a network was faster than mailing paper charts, and a full copy could reach many authorized users at once. However, reliability depends on working hardware, correct file management, and backups. Digital information is not automatically permanent.
- ③ Digital systems also create risks that the emergency team had to manage. A file can be deleted accidentally, or someone could erase or alter data on purpose. If an account password is stolen, an unauthorized person might view, copy, or change private location records. The team used access permissions, strong passwords, and backup copies to reduce these risks. To judge whether digital transmission and storage are advantageous, ask who needs the information, how quickly it must travel, how many people need copies, and what protections the data need.

2 ANSWER WITH EVIDENCE Use the passage

1 How did digital transmission help the emergency team work in two locations?

2 Why did making backup copies make the stored water-level readings more reliable?

3 Name one risk of digital information from the passage and one action the team used to reduce that risk.

4 A city is deciding whether to use digital storage and transmission for its emergency records. What four questions should the city investigate before deciding?

3 YOUR TURN Your own words

Choose a situation in which people store and share information digitally. Write three evaluation questions about that system. Then write a 40- to 60-word recommendation that names one advantage, one risk, and one protection.

PART 1 • READ AND MARK

Underline each claim about a benefit or risk of digital information. Circle the concrete detail that supports each claim. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How did digital transmission help the emergency team work in two locations?	The shared online map let team members at the school and city hall view the same updated information.
2	Why did making backup copies make the stored water-level readings more reliable?	If a laptop failed, the readings could be recovered from a backup.
3	Name one risk of digital information from the passage and one action the team used to reduce that risk.	Answers may include accidental deletion or unauthorized access. The team used backup copies, access permissions, or strong passwords.
4	A city is deciding whether to use digital storage and transmission for its emergency records. What four questions should the city investigate before deciding?	Who needs the information, how quickly it must travel, how many people need copies, and what protections the data need.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Situation: A wildlife club stores trail-camera photos in a cloud folder. 1. How quickly must researchers receive new photos? 2. Who needs permission to view or download the photos? 3. What backups will protect photos from deletion? Recommendation: Digital storage and sharing are useful because biologists in different places can examine identical photos quickly. The club should limit access with individual accounts and keep a separate backup, because a stolen password or accidental deletion could expose or remove the records.

Accept equivalent descriptions of the passage evidence and any valid risk-protection pair. For Part 3, accept varied situations if the student includes three relevant evaluation questions and a 40- to 60-word recommendation with an advantage, a risk, and a protection.