SUPERNOVA SCHOOL (SNS) One thing that you have learned from this worksheet.

CAMBRIDGE COMPUTING — GRADE 6

UNIT 3: NETWORKS & DIGITAL COMMUNICATION

Worksheet: Topics 3.1 and 3.2

Student's Name: _____

Class: _____ **Date:** _____

SECTION A: STORING AND TRANSFERRING DATA ON A NETWORK

Question 1: Complete the Sentences

Complete each sentence using the correct computing term. No word bank is provided.

1. The electronic exchange of information between devices is called _____.
2. Digital content can include text, images, audio, video, graphics, and _____.
3. A special computer that stores and manages data for users is called a _____.
4. A private network that is available only within an organisation is called an _____.
5. Sending audio or video content in small parts so that it can be played before the entire file arrives is called _____.
6. A network that connects devices using physical cables is known as a _____ network.
7. Wireless networks transmit data using _____ waves.
8. The maximum amount of data that can be transmitted over a network connection in a given amount of time is called _____.
9. A device that directs data between networks and allows devices to share an internet connection is called a _____.
10. A network that uses mobile communication towers to transfer data wirelessly is called a _____ network.

11. The system that uses satellites to help determine a device's location is called _____.
12. When too many devices attempt to use a network's available capacity, _____ may occur.

Question 2: Answer the Following Questions

a. What is digital communication? Give two examples of digital communication.

b. What is digital content? Name four types of digital content.

c. Explain the role of a server in a computer network.

d. What is an intranet? Give one example of how an intranet could be used in a school.

e. Explain the difference between downloading a file and streaming a video.

f. Describe two advantages of streaming content instead of downloading an entire file before playing it.

1. _____
2. _____

g. State two differences between wired and wireless networks.

Wired Network	**Wireless Network**
1. _____	1. _____

Wired Network	Wireless Network
2. _____	2. _____

h. Explain how Wi-Fi allows a device to connect to a network.

_____

_____

i. Describe the purpose of a router in a home or school network.

_____

_____

j. Explain how a cellular network allows people to access the internet while travelling.

_____

_____

_____

Question 3: Identify the Correct Networking Term

Read each description and write the correct term on the line.

1. A computer stores school documents so that authorised users can access them.
   Term: _____
2. A student watches a video online while the remaining parts of the video are still being transmitted.
   Term: _____
3. Computers in a school laboratory are connected using Ethernet cables.
   Term: _____
4. A student connects a tablet to the internet without using a physical cable.
   Term: _____
5. A school uses a private network to share information among its staff.
   Term: _____
6. A student uses a phone's mobile data connection while travelling in a car.
   Term: _____
7. A phone receives location information from satellites to help its user find directions.
   Term: _____

8. Many devices are using the internet simultaneously, causing videos and websites to load slowly.
   Term: _____

Question 4: True or False?

Write **True** or **False** beside each statement. Rewrite the false statements correctly.

1. A server can store documents, images, videos, and other digital content.

Answer: _____

Correction, if false: _____

2. An intranet is a private network used within an organisation.

Answer: _____

Correction, if false: _____

3. Streaming requires the entire video file to be downloaded before playback can begin.

Answer: _____

Correction, if false: _____

4. A wired network uses physical cables to connect devices.

Answer: _____

Correction, if false: _____

5. Wireless networks use radio waves to transmit data.

Answer: _____

Correction, if false: _____

6. GPS and cellular networks perform exactly the same function.

Answer: _____

Correction, if false: _____

7. A router can allow several devices to share an internet connection.

Answer: _____

Correction, if false: _____

8. High bandwidth generally allows more data to be transmitted in a given amount of time.

Answer: _____

Correction, if false: _____

9. Network overload can cause delays when loading websites and videos.

Answer: _____

Correction, if false: _____

10. Connecting more devices to a network will always make the internet faster.

Answer: _____

Correction, if false: _____

SECTION B: BANDWIDTH AND NETWORK OVERLOAD

Question 5: Understanding Bandwidth

a. Define bandwidth.

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b. Explain the relationship between bandwidth and the amount of data that can be transmitted over a network.

---

c. A student is watching an online video. The video repeatedly pauses while loading.

Give two possible network-related reasons for this problem.

1. ---
2. ---

d. Explain why a network with higher available bandwidth may provide a better experience when several people are streaming videos.

---

e. Bandwidth is sometimes compared to the width of a road.

Explain how this comparison helps us understand network performance.

Question 6: Scenario — The Busy School Network

A school has 30 computers connected to its network. During a Computing lesson, students begin downloading large files while several teachers stream educational videos. Other students are trying to access websites for research.

Soon, the network becomes very slow.

Answer the following questions.

a. Identify the network problem described in the scenario.

b. Explain why the network has become slow.

c. Describe two symptoms that students might notice when using an overloaded network.

1.
2.

d. Suggest three ways the school could reduce network congestion.

1.
2.
3.

e. Explain why increasing the available bandwidth could improve the situation.

f. Would increasing bandwidth guarantee that the network could never become overloaded? Explain your answer.

Question 7: Apply Your Knowledge

Read each situation and select the most suitable answer.

1. A student needs a reliable connection for an online examination in a computer laboratory. Which connection would generally be the best choice?

□ A. Wired Ethernet connection
□ B. Cellular connection only
□ C. GPS connection
□ D. No network connection

2. A student wants to use a tablet while moving around the school building. Which connection is most suitable if the school provides wireless network coverage?

□ A. Ethernet cable only
□ B. Wi-Fi
□ C. GPS only
□ D. A printer connection

3. Several family members are streaming high-quality videos while other devices are downloading large files. What is the most likely result?

□ A. The available bandwidth may become insufficient for all activities.
□ B. The router will automatically create unlimited bandwidth.
□ C. All files will become smaller.
□ D. The network will stop using data.

4. Which action is most likely to reduce unnecessary network traffic?

□ A. Starting more large downloads
□ B. Streaming several videos at once
□ C. Pausing downloads that are not currently needed
□ D. Connecting every available device

5. A student wants to find directions to a museum using a navigation app. Which technology helps determine the phone's location using satellites?

□ A. Bandwidth
□ B. GPS
□ C. Ethernet
□ D. Intranet

SECTION C: NETWORK CONNECTIONS IN REAL-LIFE SITUATIONS

Question 8: Wired or Wireless?

For each scenario:

- Identify the most suitable connection: **Wired** or **Wireless**.
- Give a reason for your choice.

Scenario 1

A school computer laboratory requires stable connections for students completing programming tasks.

Connection: _____

Reason: _____

Scenario 2

A student wants to use a tablet in the school library without carrying a network cable.

Connection: _____

Reason: _____

Scenario 3

An office needs reliable connections between desktop computers that frequently transfer large files.

Connection: _____

Reason: _____

Scenario 4

A visitor wants to access the internet using a smartphone at a café that provides Wi-Fi.

Connection: _____

Reason: _____

Scenario 5

A hospital needs reliable network connections for desktop computers used to access patient records.

Connection: _____

Reason: _____

Scenario 6

A person is travelling on a bus and wants to browse the internet using mobile data.

Connection: _____

Reason: _____

SECTION D: SECURING DATA

Question 9: Complete the Sentences

Complete each sentence using the correct computing term. No word bank is provided.

1. Protecting digital information from unauthorised access, use, or theft is called _____.
2. Checking a user's identity before allowing access to a device or account is known as user _____.
3. A secret combination of characters used to protect an account is called a _____.
4. A security method that identifies a user by scanning the unique patterns on a finger is called _____ recognition.
5. A security method that uses a person's facial features to verify their identity is called _____ recognition.
6. A fraudulent attempt to trick someone into revealing personal information is called _____.
7. When someone uses another person's personal information to pretend to be that person, it is known as identity _____.
8. Changing readable data into an unreadable form to protect it is called _____.
9. A fraudulent message that appears to come from a trusted organisation may be an example of a _____ attack.
10. A secret combination of characters that is difficult to guess is an example of a _____ password.

Question 10: Why Must Data Be Kept Secure?

a. Explain why personal data needs to be protected when it is shared online.

---

b. Give three examples of sensitive information that should be kept secure.

1. _____
2. _____
3. _____

c. Explain what is meant by unauthorised access.

_____

_____

d. Describe two problems that could occur if someone's personal information were stolen.

1. _____
2. _____

e. Explain the difference between fraud and identity theft.

_____

_____

_____

f. Why is it important to keep your account login details private?

_____

_____

_____

Question 11: User Authentication

a. What is user authentication?

_____

_____

b. State three methods that can be used to authenticate a user.

1. _____
2. _____
3. _____

c. Explain how fingerprint recognition can be used to authenticate a user.

_____

d. Describe one advantage and one limitation of facial recognition.

Advantage: _____

Limitation: _____

e. Explain why a password should be difficult to guess.

f. A student uses the same password for their email, gaming account, and school account.

Explain why this is a security risk.

g. Is using a username and password alone an example of two-factor authentication? Explain your answer.

Question 12: Evaluate Password Strength

Examine the passwords below.

Password	Strength rating (1–5)	Reason for your rating
Arun123	_____	_____
qwerty123	_____	_____
Purple123	_____	_____
CatLoverP@ncake!492	_____	_____

Password	Strength rating (1–5)	Reason for your rating
Pomegranate23	_____	_____

a. Which password in the table is the strongest? Explain your choice.

b. Which password is the weakest? Give two reasons for your answer.

c. State three characteristics of a strong password.

1.
2.
3.

d. Explain why a long password made entirely from predictable words may still be vulnerable.

e. A student wants to improve a weak password. Describe three changes that could make it harder to guess.

1.
2.
3.

f. Explain why passwords should not contain easily guessed personal information, such as a name or date of birth.

g. Create an example of a strong password. Do not use your real name, birthday, or any password that you currently use.

Example password: _____

Explain two features that make your example difficult to guess.

1.

2. _____

SECTION E: RECOGNISING ONLINE SECURITY RISKS

Question 13: Safe or At Risk?

Read each scenario. Write **Safe** or **At Risk** and explain your answer.

Scenario 1

Ali receives an email claiming to be from his bank. It asks him to click a link and enter his account password.

Decision: _____

Reason: _____

Scenario 2

Sara posts her home address, phone number, and date of birth on a public social media account.

Decision: _____

Reason: _____

Scenario 3

Hassan uses a different, strong password for each of his important online accounts.

Decision: _____

Reason: _____

Scenario 4

Ayesha receives a message claiming she has won a free laptop. She is asked to provide her bank details to receive the prize.

Decision: _____

Reason: _____

Scenario 5

Usman receives an unexpected attachment from an unknown sender. He opens it without checking whether it is safe.

Decision: _____

Reason: _____

Scenario 6

Mariam checks the website address carefully and independently visits her bank's official website instead of clicking a suspicious link.

Decision: _____

Reason: _____

Question 14: Understanding Phishing

a. What is phishing?

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b. Describe three different ways in which a phishing attack might occur.

1. ---

---

2. ---

---

3. ---

---

c. Explain why a phishing message may appear to come from a trusted person or organisation.

---

d. Give three warning signs that an email or message might be a phishing attempt.

1. ---
2. ---
3. ---

e. What should you do if you receive a suspicious message asking for your password?

---

f. Explain why you should not enter personal information on a website simply because it displays a padlock symbol.

SECTION F: EXTENDED SCENARIO-BASED QUESTIONS

Question 15: The School Network

SuperNova School has installed a network to help students and teachers share resources.

The network includes:

- Desktop computers in the computer laboratory.
- Laptops and tablets used by teachers.
- A central server containing learning materials.
- A printer shared by several computers.
- A wireless access point that allows mobile devices to connect.

Answer the following questions.

a. Identify the device that stores the school's shared learning materials.

---

b. Explain one benefit of storing learning materials on a central server rather than keeping a separate copy on every computer.

---

c. Which type of connection would generally be most suitable for the laboratory desktop computers: wired or wireless? Give a reason.

---

d. Explain how wireless connectivity benefits teachers using laptops and tablets.

e. During a busy lesson, students report that videos are buffering and websites are loading slowly.

Explain how bandwidth and network overload might contribute to this problem.

f. Suggest two actions the school could take to improve network performance.

1.
2.

g. Explain why the school should protect access to its server and shared files.

h. Recommend two security measures the school could use to protect its network and data.

1.
2.

Question 16: Protecting an Online Account

Zara uses an online learning platform to access her schoolwork. She receives an email asking her to confirm her account details through a link. The email looks official, but Zara does not recognise the sender. She also uses the same password for several websites.

Answer the following questions.

a. Identify the possible security threat in the email.

b. Describe two warning signs that Zara should check before trusting the email.

1.
2.

c. Explain what Zara should do instead of clicking the link.

d. Explain why reusing the same password on several websites is risky.

e. Recommend two ways Zara could improve the security of her online accounts.

1.
2.

f. Explain how user authentication helps protect Zara's schoolwork.

g. Zara enables fingerprint authentication on her phone. Explain how this could help protect access to her device.

SECTION G: CHALLENGE QUESTIONS

These questions require you to apply your knowledge to unfamiliar situations.

Question 17: Choose and Justify

A family has four smartphones, two laptops, a smart television, and several smart home devices connected to the same Wi-Fi network.

In the evening, everyone starts streaming videos, while one laptop downloads a large file.

a. Explain why the internet connection might become slow.

b. Identify one device or activity that could be temporarily disconnected or paused to reduce network congestion.

c. Explain why increasing the available bandwidth may improve the family's internet experience.

d. Suggest one additional action the family could take to improve network performance.

Question 18: Explain the Differences

Explain the difference between each pair of terms.

a. Server and router

b. Wired network and wireless network

c. Streaming and downloading

d. Bandwidth and network overload

e. Authentication and encryption

f. Phishing and identity theft

Question 19: A Complete Network and Security Plan

A school plans to provide students with online access to digital textbooks, videos, assignments, and research materials. Students will use desktop computers, laptops, and tablets.

The school wants the network to perform efficiently while keeping student information secure.

Write a short report explaining how the school should set up and protect its network.

Your report should include:

- The purpose of a server.
- The use of wired and wireless connections.
- The importance of bandwidth.
- The problem of network overload.
- Two ways to protect student data.
- The role of user authentication.
- One example of a possible online security threat and how to avoid it.

Your report:

One thing that you have learned from this worksheet.