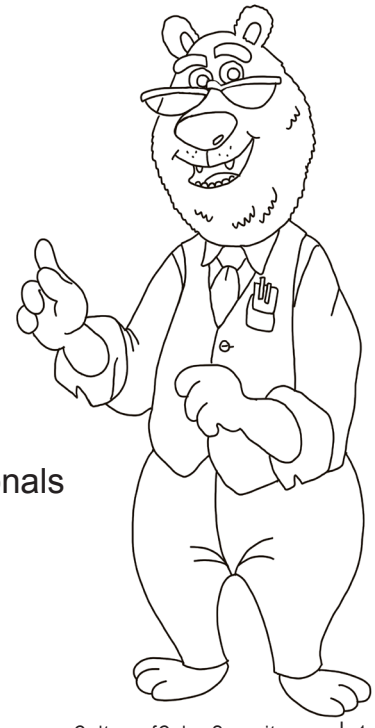
My name is _____

The CyBears Need Your Help!

Can you unscramble the words below to help decipher what Grace CyBear can do to keep her electronic devices safe from bad guys?

1. NTUARVSII _____
2. AILFLWRE _____
3. ECNONPRITY _____
4. OTPEYHON _____
5. ASRPOWDS _____
6. SROTAEFW UDEPTA _____

Great job! Now, Alan CyBear needs cyber sleuths like you to help him understand some of the words you just unscrambled. Use the context to find the answers!



7. When logging into an electronic device, you use this **secret word** to gain access to the system.

   a. Firewall b. Password c. Encryption

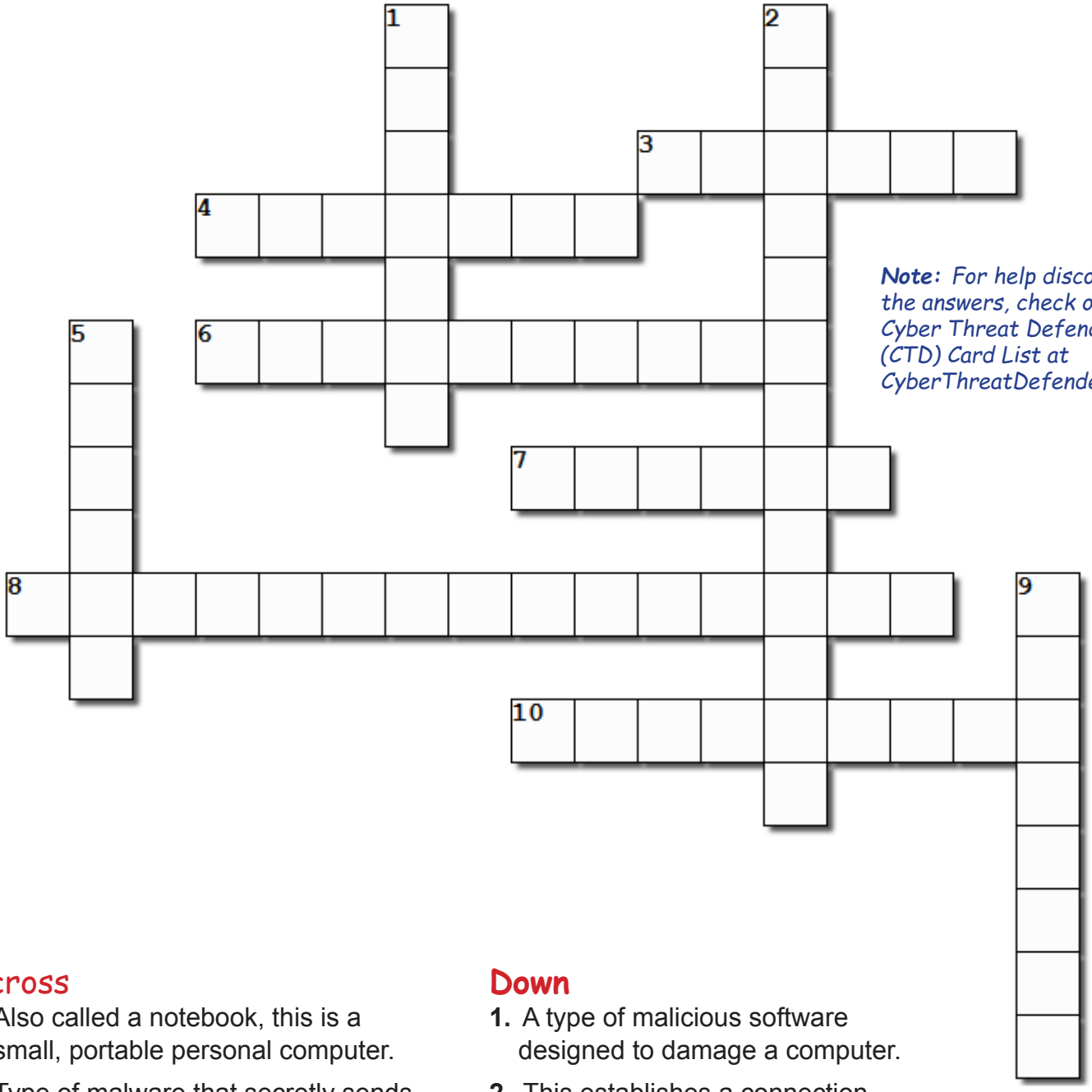
8. Part of a computer system that is designed to **block** unauthorized access to important information.

   a. Anti-Virus b. Honeypot c. Firewall

9. This is a decoy used to **attract** cyber attackers and capture them **sticky**-"handed" in a crime. This trap helps cybersecurity professionals to detect and learn more about the attacker's activities and prevent future cyber crimes.

   a. Update Software b. Anti-Virus c. Honeypot

Cybersecurity for All Crossword Puzzle



Note: *For help discovering the answers, check out the Cyber Threat Defender (CTD) Card List at CyberThreatDefender.com*

Across

3. Also called a notebook, this is a small, portable personal computer.

4. Type of malware that secretly sends information about your data to an attacker.

6. Process of encoding a message that only certain people can access.

7. A device that provides access to the Internet.

8. A personal computer designed for regular use at a single location.

10. Type of malware that reports all your actions online to an attacker.

Down

1. A type of malicious software designed to damage a computer.

2. This establishes a connection between your computer and the Internet.

5. This system is more powerful, has more memory, and is dedicated to running your network services.

9. A network security system that monitors and controls information coming in and out of a network.

Matching Online Terms

Ada CyBear is helping explain common definitions for using the Internet and connecting with friends online to her grandmother. However, Ada is also getting confused. Help Ada and her grandmother match the correct word with their definition.

Circle the correct answer below. *HINT: Review the Pronoun sentences on page 8 for clues to the answers.*

1 Rules or manners for interacting courteously with others online.

A) Etiquette
C) Setiquette
B) Detiquette
D) Netiquette

2 A list of friends a user interacts with online through various media, such as instant messaging (IM) and chat.

A) Yearbook
C) Buddy List
B) Cloud
D) Skywalkers

3 Methods individuals use to track, lure, or harass another person online.

A) Spyware
C) Spam
B) Cyberstalking
D) Cipher

4 A location online that allows multiple users to communicate electronically with each other in real time.

A) Chatroom
C) Social Room
B) Modem
D) Browser

5 Willful and repeated harm inflicted through electronic text, typically through emails or websites.

A) Cyberbullying
C) Botnet
B) Grey Hat
D) Flame

6 The nickname a user has chosen to be identified by when playing Internet games.

A) Cybercop
C) User
B) Droid
D) Gamer Tag

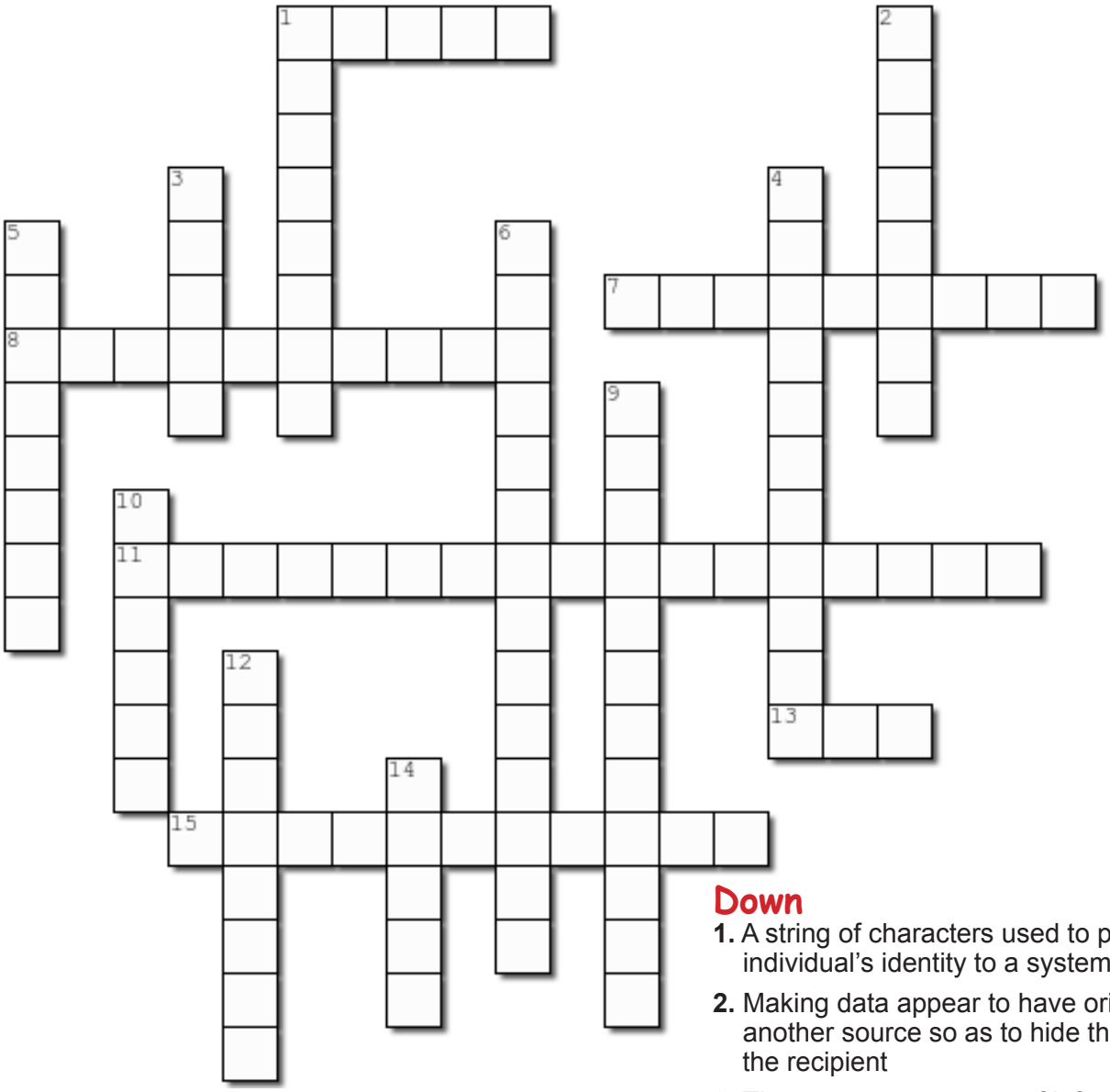
7 A diary or personal journal kept on a website. Usually updated frequently are grouped by specific subjects.

A) Real-time
C) Banner
B) Blog
D) Post

8 Internet gamers who intentionally cause problems or cyberbully other gamers.

A) Vaders
C) Black Hatters
B) Blended Threat
D) Griefers

Cybersecurity for All Crossword Puzzle



Across

1. A replacement set of code designed to correct problems or weaknesses in existing software

7. A step-by-step procedure used to solve a problem

8. Used to show the result of an encryption algorithm

11. The network layer protocol used by the Internet for routing packets across a network

13. A sequence of characters or bits used by an algorithm to encrypt or decrypt a message

15. A cryptographically signed object that contains an identity and a public key associated with this identity

Down

1. A string of characters used to prove an individual's identity to a system or object

2. Making data appear to have originated from another source so as to hide the true origin from the recipient

3. The temporary storage of information before use, typically used to speed up systems

4. A type of attack that overwhelms a server or network with more traffic than it can handle, resulting in the system crashing

5. A hidden method used to gain access to a computer system, network, or hidden application

6. The process by which a subject's (or a user's) identify if verified

9. The art of secret writing that enables someone to hide the contents of a message or file from everyone but the person received

10. A coding system that converts messages into ciphertext using its algorithm and key

12. A network device used to segregate traffic based on rules

14. A form of malware or software that attaches itself to other pieces of code in order to replicate

Reasoning

Help Grace CyBear match the correct definition with the word in the right column by drawing a line between them.

HINT: *Review the stories on page 12 to determine the answers.*

1. A technology that allows us to access files through the Internet from anywhere in the world.
2. An exchange of data, information, and knowledge to manage risks or respond to cyber incidents.
3. To convert enciphered text to plain text by means of a cryptographic system.
4. The interdependent network of information technology infrastructures, which includes the Internet, telecommunications networks, computer systems, and embedded processors and controllers.
5. A set of programs that tell a computer to perform a task.
6. The use of mathematical techniques to provide security services, such as confidentiality, data integrity, entity authentication, and data origin authentication.
7. A tool that allows the user to remain anonymous while using the Internet by masking the location and encrypting traffic.
8. An Internet version of a home address for your computer, which is identified when it communicates over a network.

Cyberspace

Cloud

Virtual Private Network (VPN)

IP Address

Information Sharing

Cryptography

Software

Decipher

Spelling

Read each definition and circle the word that is spelled correctly.

1.	Method to protect the privacy of information by encrypting it into a secret code.	Cryptography Cryptographie Criptegraphy
2.	Processes employed to safeguard and secure crucial information of an organization.	Cibersecurity Cybearsecurity Cybersecurity
3.	Malicious intent to prevent the users of the cryptosystem from achieving their goal.	Advirsary Adversary Advesary
4.	Process of monitoring and recording data that is flowing between two points in a communication system.	Wiretaping Waretapping Wiretapping
5.	An algorithm for performing encryption or decryption of code.	Ciypher Cipher Cepher
6.	Process of decoding cipher text to plain text, so it is readable by the user.	Dicryption Decription Decryption
7.	A secret sequence of characters that is used as a form of authentication to confirm a user's identity in a computer program or online.	Passwerd Password Pasword
8.	An expert programmer who uses computer systems to gain unauthorized access to a computer system.	Hacker Haker Hakcer
9.	An action to deliberately change or alter a system's logic, data, or control information to cause the system to perform unauthorized functions or services.	Taemper Tamper Tampper
10.	A flaw that allows someone to operate a computer system with authorization levels in excess of that which the system owner specifically granted.	Valnerability Vulneriblity Vulnerability

Caesar Cipher

The Roman Emperor Gaius Julius Caesar used the shift cipher, also known as the Caesar Cipher, to encrypt messages he sent to his generals. To encrypt a word or message means to hide that message by turning it into a secret code. If you'd like to send secret messages to your friends or family, the shift cipher may be the way to go!

A **shift cipher** is a type of substitution cipher that works by shifting the ciphertext from their original position to a new position in the alphabet. The plaintext is replaced with ciphertext that is in that position.

To begin the exercise, look at the two rows of the alphabet below. The top row is in plaintext (PT) and the bottom row will be your ciphertext (CT).

PT	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
CT	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C

The table above shows the ciphertext row has shifted by three positions to the left.

In a shift cipher, the key is the number of spaces a ciphertext has shifted and it is what is used to encrypt or decrypt messages. Remember, in this example the chosen "key" is three (3). Now, let's move on to encryption and decryption!

Encryption & Decryption

To encrypt a word, you'll need to look at the plaintext first and figure out what it will become by looking at the letter below it. Using the table above, notice that the letter, or plaintext, *"A" will become "D" in ciphertext.* Use the cipher key (the table above) to encrypt the following words:

Password - ___ ___ ___ ___ ___ ___ ___ ___

Encryption - ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Great Job! Now try decryption to change an encrypted word back into plaintext. This time you'll need to look at the ciphertext first (bottom row) and see what it will be in plaintext. *The ciphertext "B" is actually "Y" in plaintext.*

GHFUBS - ___ ___ ___ ___ ___ ___

Shift Cipher - Decoding

Let's practice using the oldest type of cipher, the Caesar Cipher! Also known as a shift cipher, Alan CyBear needs your help filling in the ciphertext (CT) row below by using a key of 3. This means you will needs to shift the alphabet by three positions. The first letter has been done for you.

Remember, the first row is the plaintext (PT), and the CT row is used to help you encode and decode a message.

PT	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
CT	D

For each sentence below, decipher the messages using the shift cipher key of 3 above. For example, "L ORYH FKHHVH" becomes "I LOVE CHEESE".

1. QHYHU JLYH RXW SHUVRQDO LQIRUPDWLRQ.

2. FUHDWH XQLTXH SDVVZRUGV.

3. WKLQN WZLFH EHIRUH BRX SRVW.

4. WKLQN WZLFH EHIRUH BRX FOLFN.

5. VSHDN XS QRQ'W VWDQG IRU EXOOBLQJ.

Caesar Cipher - Encoding

Let's practice using the oldest type of cipher, the Caesar Cipher! Also known as a shift cipher, Grace CyBear needs your help filling in the ciphertext (CT) row below by using a key of 3. This means you will needs to shift the alphabet by three positions. Fill in the CT row to encrypt the messages below.

Remember, the first row is the plaintext (PT), and the CT row is used to help you encode and decode a message.

PT	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
CT	

For each sentence below, encipher the messages using the shift cipher key of 3 above. For example, "I LOVE CHEESE" becomes "L ORYH FKHHVH".

1. Keep your passwords secret.

2. Be respectful when you are online.

3. Do not talk to strangers.

4. Tell an adult when you feel threatened or scared.

5. Ask before you download.

Shift Cipher - Decoding Secret Messages

Keep practicing the shift cipher by decoding the secret messages below. Start by filling in the ciphertext (CT) with a shift key of 5. Next, decode the messages.

Code: Shift Cipher
Key: Shift + 5

PT	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
CT	

Coded Message 1:

V YZIDVG JA NZMQDXZ VOOVXF XVI KMZQZIO
V XJHKPOZM AMJH VXXZNNDIB RZWNDOZN

__ __

__ __

__ __

__ __

Coded Message 2:

RDMZGZNN MJPOZMN VGGJR YZQDXZN GDFZ
KCJIZN OJ XJIIZXO OJ OCZ DIOZMIZO

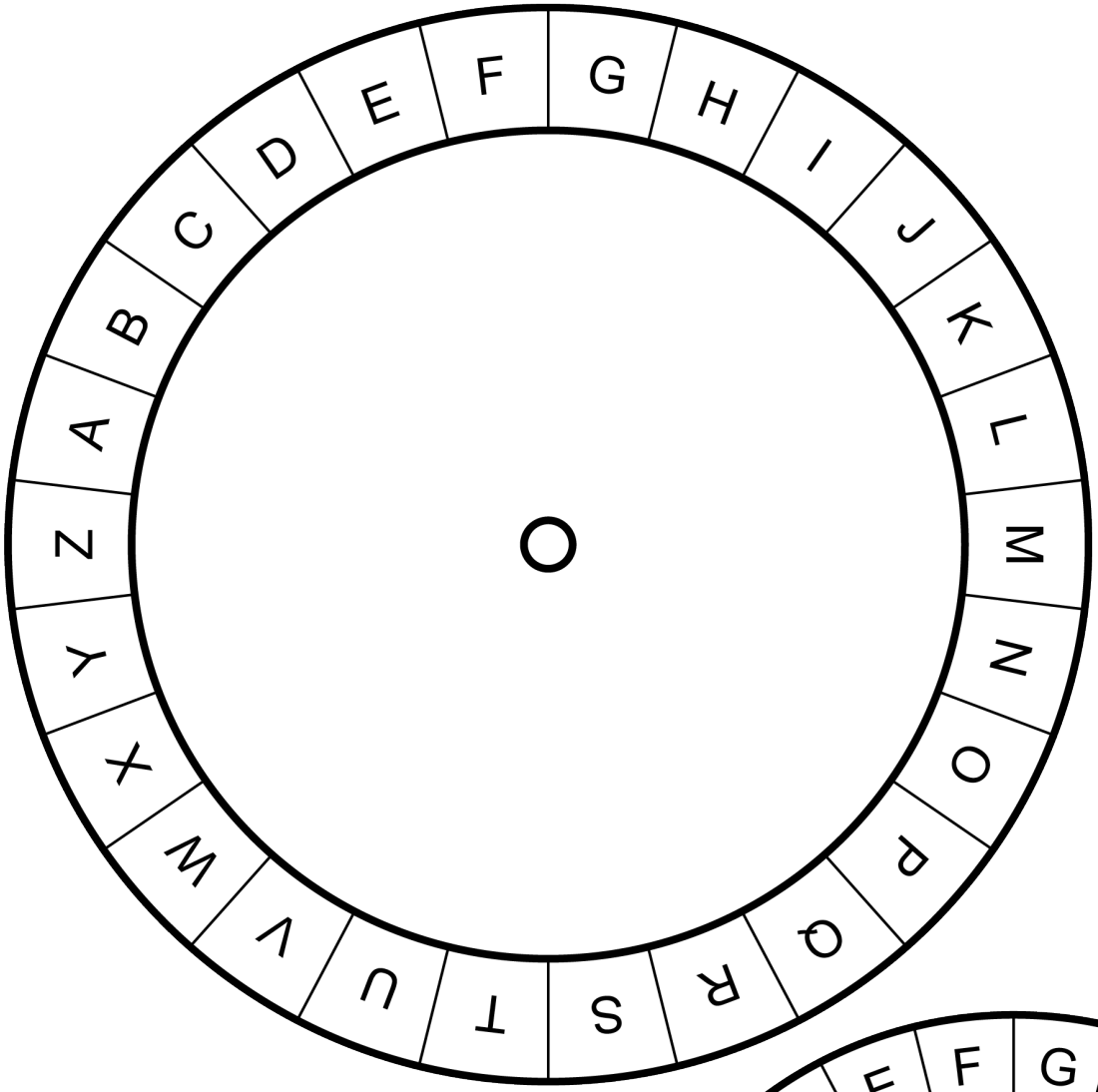
__ __

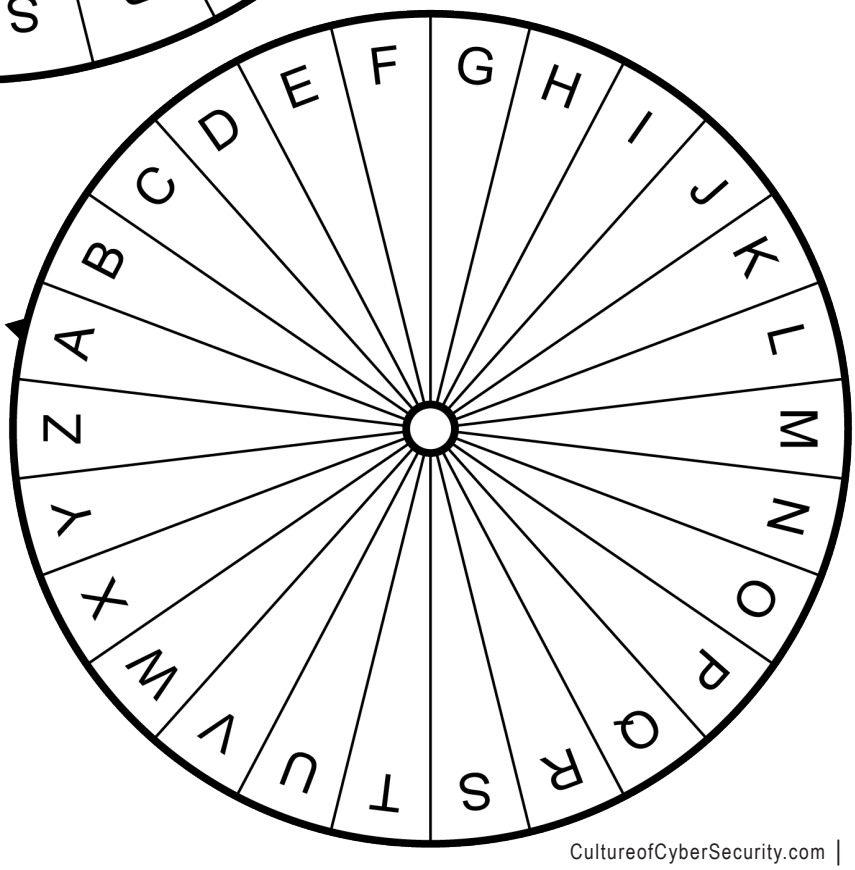
__ __

__ __

__ __

Cipher Wheel (Cut Out the Two Wheels)





Cipher Wheel - Encryption

The **cipher wheel** is a tool used to encrypt and decrypt shift ciphers using a "key".

The large wheel is your **plaintext** and the smaller wheel is your **ciphertext**. To use wheels, cut out both wheels on page 24 and place the smaller wheel on top of the large wheel.

Now that you have your cipher wheel, **shift the ciphertext around to the left** to solve puzzles with more than one key. Try encrypting the following phrases using your cipher wheel.

The number below each word is the unique key for that word.

Message 1:

CYBERSECURITY	IS	A	SHARED	RESPONSIBILITY
5	3	14	9	22

_____ ____ __

_____ _____

Message 2:

CRYPTOGRAPHY	CAN	CREATE	SECRET	MESSAGES
9	1	13	7	18

_____ ___

_____ _____ _____

Message 3:

BREAK	THE	CODE	USING	A	CIPHER	WHEEL
23	8	11	5	2	25	4

_____ _____ _____ _____

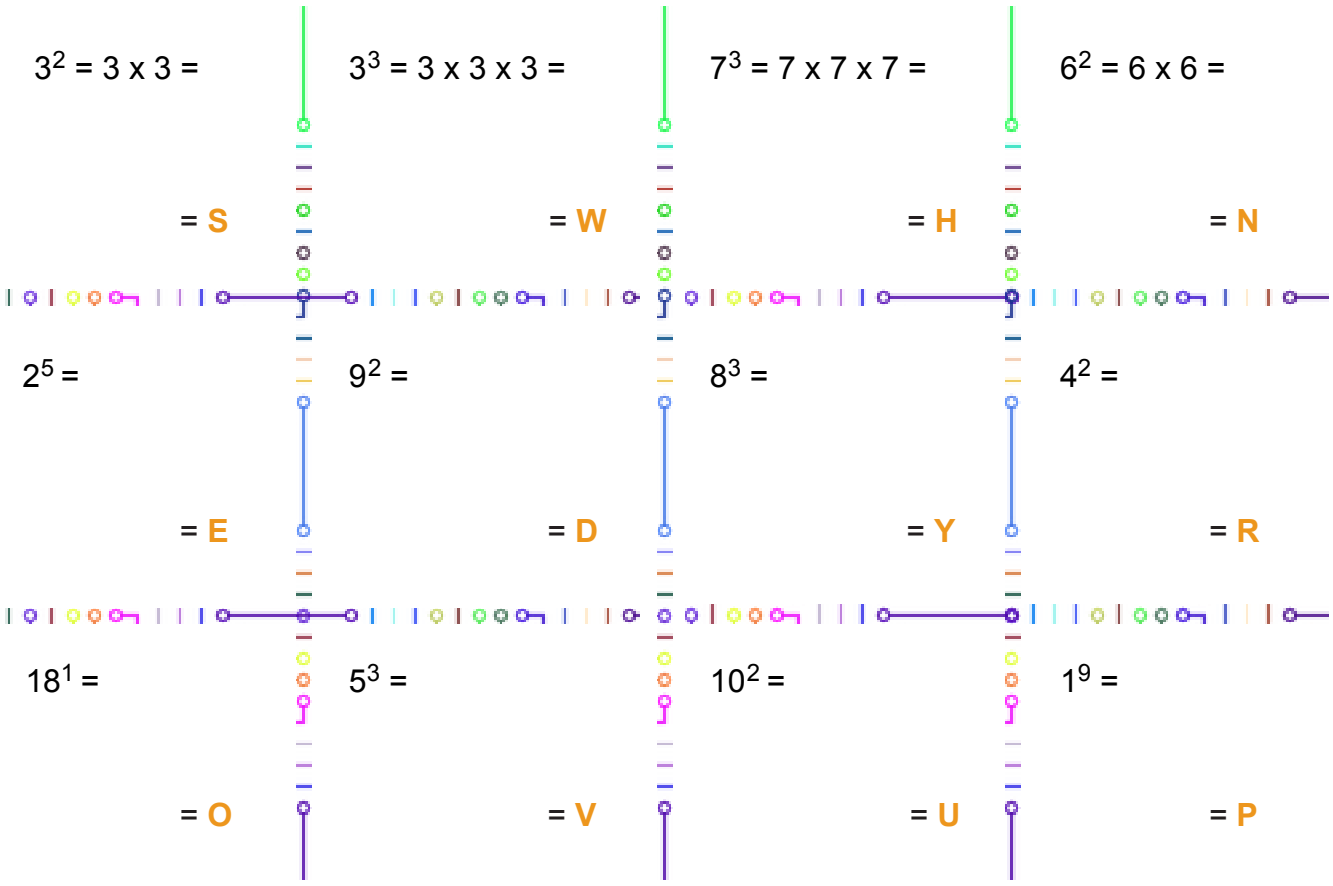
__ _____ _____

Using Exponents

An **exponent** refers to the number of times a number is multiplied by itself.

Solve the following exponents and use the letter next to the answer to discover a very important computer rule!

Example: $5^4 = 5 \times 5 \times 5 \times 5 = 625 = A$

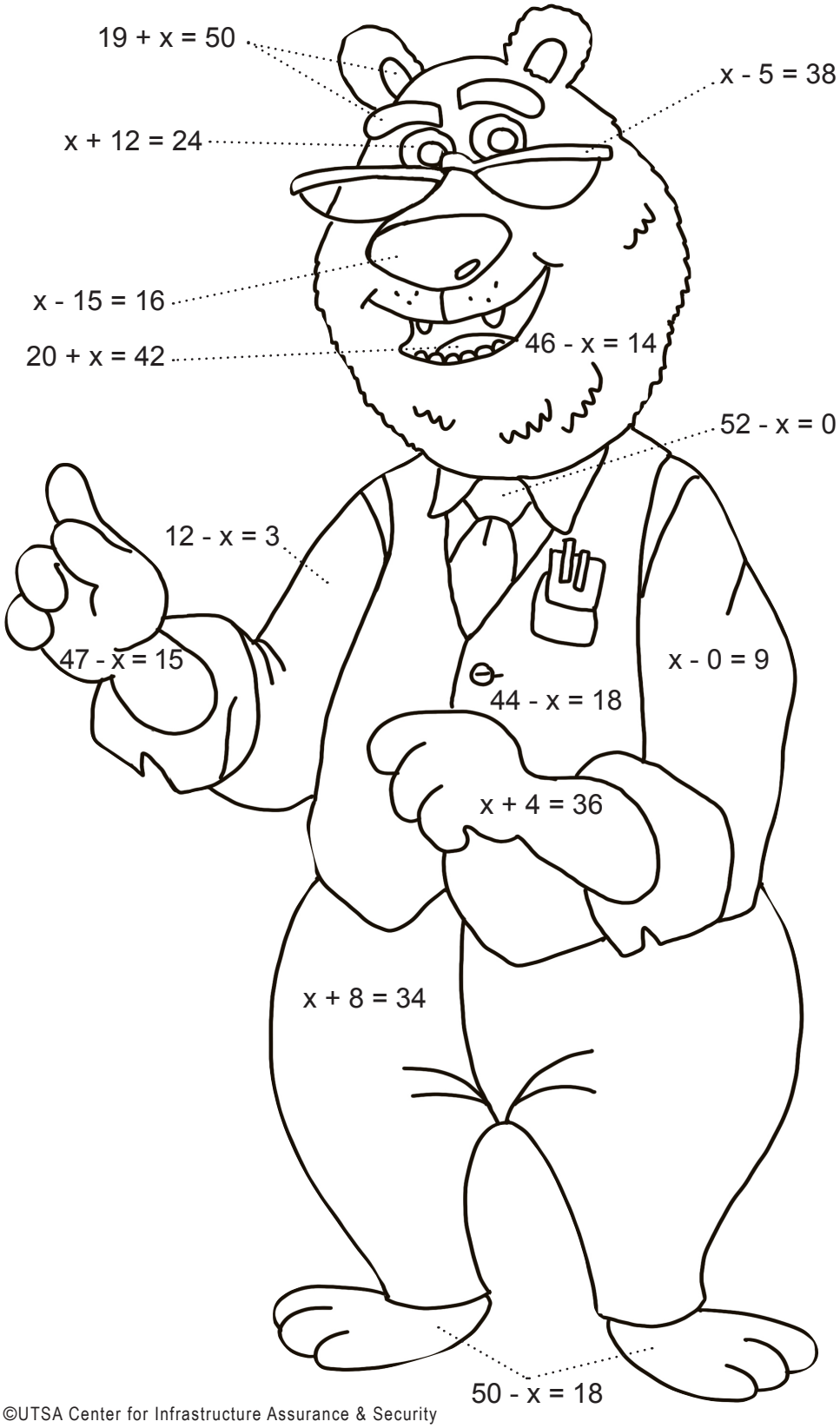


36	32	125	32	16		9	343	A	16	32

512	18	100	16		1	A	9	9	27	18	16	81	9
						625							

Color Codes

Solve the problem for X. Using the Color Code Key below, color in Alan CyBear.



Color Code

31	dark brown
26	blue
32	brown
43	black
22	red
12	green
52	orange
9	white

Using Contractions to Outsmart Cyber Crooks

A contraction blends two words into one by replacing one or more letters with an apostrophe ('). For example:

it + is = *it's* **it + will = *it'll***

Find the contraction in the following sentences. Underline the contraction. Then write the two separate words that formed the contraction. The first one has been done for you.

1. They're trying to steal your private information. They are
2. Don't click on suspicious links or pop-ups. _____
3. We're watching out for cyber criminals. _____
4. Hackers can't break in if you update. _____
5. You'll stay safer with strong passwords. _____
6. Many eCrime adversaries won't stop until they are caught. _____
7. Chatty Spider sends fake emails–don't trust them. _____
8. They'd love to trick you into clicking. _____
9. Holiday Spider is pretending to be someone they're not. _____
10. They'd love for you to fall victim to ransomware. _____
11. Hook Spider knows it's risky to download unknown files. _____
12. He's pretending to be someone he is not. _____

CIAS CROWDSTRIKE

Crack the Code: Use Clues to Solve Cyber Words

Hacker	Cybersecurity	Falcon	Malware	Password
Update	Spider	Phishing	Spyware	Encryption

Read the clues. Write the word next to the clue. Then find and circle each word in the puzzle.

P O X H U E Y H M T E T E S S
A B U N X N N M A A Q A G P P
S P P H H T F C Y C L H Z Y I
S H D Q X Z G S R R K W F W D
W I A F A L C O N Y K E A A E
O S T Z L D W L F R P M R R R
R H E V Q G E N G B I T V E E
D I C Y B E R S E C U R I T Y
S N J J V G X V Y H H J A O N
Z G O Y G I B G G L S W T J N

1. Bad software that harms computers. _____
2. A symbol for eCrime cyber criminals. _____
3. A secret word for safety. _____
4. Hides what you send online. _____
5. A fake email or message. _____
6. You must do this to stay safe. _____
7. A bird symbol for cyber defense. _____
8. Spy program watching your moves. _____
9. Keeps your data safe and private. _____
10. Tries to break into networks. _____

Identifying Cyber Threats in Messages

Cybercriminals often use tricky messages to steal information. Read the practice messages below and complete the following:

1. Circle the suspicious elements
2. Explain why it's suspicious
3. Write the correct action you should take

Example:

Message: "Your Netflix account will be locked! Click here immediately!"
Suspicious elements: Urgency, exclamation marks, generic greeting
Action: Delete the message and check your account directly through Netflix's website

Practice Messages

1. "URGENT: We're trying to verify your bank information. Click link: www.bank-verify.net"
   Suspicious elements: _____
   Action: _____

2. "We're from tech support – your computer has a virus! Call now: 555-0123"
   Suspicious elements: _____
   Action: _____

3. "You'll receive $1,000 if you forward your password today!"
   Suspicious elements: _____
   Action: _____

4. "User 50 says: You've won a free iPhone! Claim in 24 hours!"
   Suspicious elements: _____
   Action: _____

5. "It's your lucky day! Download this attachment to claim your prize"
   Suspicious elements: _____
   Action: _____

Cyber Safety Tip Box

Never click suspicious links.

Don't trust urgent messages asking for personal information

Check the sender's email address carefully.

When in doubt, ask a trusted adult.

CyBear Activity Sheets - Answers

PAGE 1

1. Antivirus
2. Firewall
3. Encryption
4. Honeypot
5. Password
6. Software Update
7. b
8. c
9. c

PAGE 2

1. malware
2. ISPConnection
3. laptop
4. spyware
5. server
6. encryption
7. router
8. desktopcomputer
9. firewall
10. keylogger

PAGE 3

1. D 2. C 3. B 4. A
5. A 6. D 7. B 8. D

PAGE 4

Across

1. patch
7. algorithm
8. ciphertext
11. internet protocol
13. key
15. certificate

Down

1. password
2. spoofing
3. cache
4. ddos attack
5. backdoor
6. authentication
9. cryptography
10. cipher
12. firewall
14. virus

PAGE 5

1. Cloud
2. Information Sharing
3. Decipher
4. Cyberspace
5. Software
6. Cryptography
7. Virtual Private Network (VPN)
8. IP Address

PAGE 6

1. Cryptography
2. Cybersecurity
3. Adversary
4. Wiretapping
5. Cipher
6. Decryption
7. Password
8. Hacker
9. Tamper
10. Vulnerability

PAGE 7

Password - SDVVZRUG
Encryption - HQFUBSWLRQ
GHFUBS - Decrypt

PAGE 8

1. Qhyhu jlyh rxw shuvrqdo lqirupdwlrq =
   Never give out personal information
2. Fuhdwh xqltxh sdvvzrugv =
   Create unique passwords
3. Wklqn wzlfh ehiruh brx srvw =
   Think twice before you post
4. Wklqn wzlfh ehiruh brx folfn =
   Think twice before you click
5. Vshdn xs, grq'w vwdqg iru exooblqj =
   Speak up, don't stand for bullying

PAGE 9

1. Keep your passwords secret =
   Nhhs brxu sdvvzrugv vhfuhw
2. Be respectful when you are online =
   Eh uhvshfwixo zkhq brx duh rqolqh
3. Do not talk to strangers =
   Gr qrw wdon wr vwudqjhuv
4. Tell an adult when you feel threatened or scared
   = Whoo dq dgxow zkhq brx ihho wkuhdwhqhg ru vfduhg
5. Ask before you download =
   Dvn ehiruh brx grzqordg

PAGE 10

Coded Message 1: A DENIAL OF SERVICE ATTACK CAN PREVENT A COMPUTER FROM ACCESSING WEBSITES

Coded Message 2: WIRELESS ROUTERS ALLOW DEVICES LIKE PHONES TO CONNECT TO THE INTERNET

PAGE 12

Message 1:

CYBERSECURITY	IS	A	SHARED
HDGJWXJHZWNYD	LV	O	BQJANM

CyBear Activity Sheets - Answers

PAGE 12 (Continued)

RESPONSIBILITY
NAOLKJOEXEHEPU

Message 2:
CRYPTOGRAPHY CAN CREATE
HWDUYTLWFUMD DBO PERNGR

SECRET MESSAGES
ZLJYLA EWKKSYWK

Message 3:
BREAK THE CODE USING A
YOBXH BPM NZOP ZXNSL C

CIPHER WHEEL
BHOGDQ A L I I P

PAGE 13

S=9; W=27; H=343; N=36; E=32; D=81; Y=512; R=16; 0=18; V=125; U=100; P=1
Answer: Never Share Your Passwords

PAGE 14

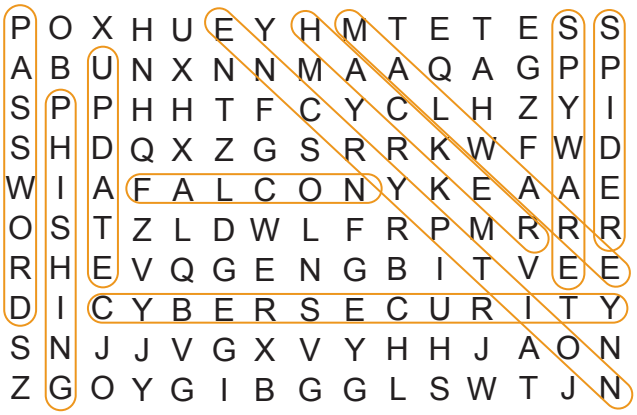
19 + **31** = 50
12 + 12 = 24
31 - 15 = 24
20 + **22** = 42
12 - **9** = 3
47 - **32** = 15
26 + **8** = 34

50 - **32** = 18
43 - 5 = 38
46 - **32** = 14
52 - **52** = 0
9 - 0 = 9
44 - **26** = 18
32 + 4 = 36

PAGE 15

1. They're trying to steal your private information. — They are
2. Don't click on suspicious links or pop-ups. — Do not
3. We're watching out for cyber criminals. — We are
4. Hackers can't break in if you update. — can not
5. You'll stay safer with strong passwords. — You will
6. Many eCrime adversaries won't stop until they are caught. — will not
7. Chatty Spider sends fake emails–don't trust them. — do not
8. They'd love to trick you into clicking. — they would
9. Holiday Spider is pretending to be someone they're not. — they are
10. They'd love for you to fall victim to ransomware. — They would
11. Hook Spider knows it's risky to download unknown files. — it is
12. He's pretending to be someone he is not. — He is

PAGE 16



1. Malware
2. Spider
3. Password
4. Encryption
5. Phishing
6. Update
7. Falcon
8. Spyware
9. Cybersecurity
10. Hacker

PAGE 17

1. "URGENT: We're trying to verify your bank information. Click link: www.bank-verify.net"
   Suspicious elements: The word URGENT, the message asking for bank information, not using the real bank website
   Action: Do not click on the link. Do not give out personal information.
2. "We're from tech support – your computer has a virus! Call now: 555-0123"
   Suspicious elements: Using sense of urgency without proof. Unknown sender - it just says tech support. Real companies don't ask you to call random phone

CyBear Activity Sheets - Answers

PAGE 17 continued

2. **Action:** Do not call the number. Do not reply or click on anything. Delete the message.
3. "You'll receive $1,000 if you forward your password today!"

   Suspicious elements: Too good to be true by offering a big reward. Request for password. Sense of urgency with word "today". Strange instructions.

   Action: Do not reply or share your password. Delete the message. Tell a trusted adult.
4. "User 50 says: You've won a free iPhone! Claim in 24 hours!"

   Suspicious elements: User 50 is not someone you now. Too good to be true. Sense of urgency and no real details about prize.

   Action: Do not click or reply. Delete the message. Tell a trusted adult.
5. "It's your lucky day! Download this attachment to claim your prize"

   Suspicious elements: Tries to get attention with excitement. Promises something free. Tells you to click or download something.

   Action: Do not click or download anything. Delete the message. Tell a trusted adult.