INTRO TO CODING WORKSHEETS

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ACTIVITY 1: Caesar Cipher

ENCODING EXAMPLE:

KEY: A → _

H E L L O

↓ ↓ ↓ ↓ ↓

_ _ _ _ _

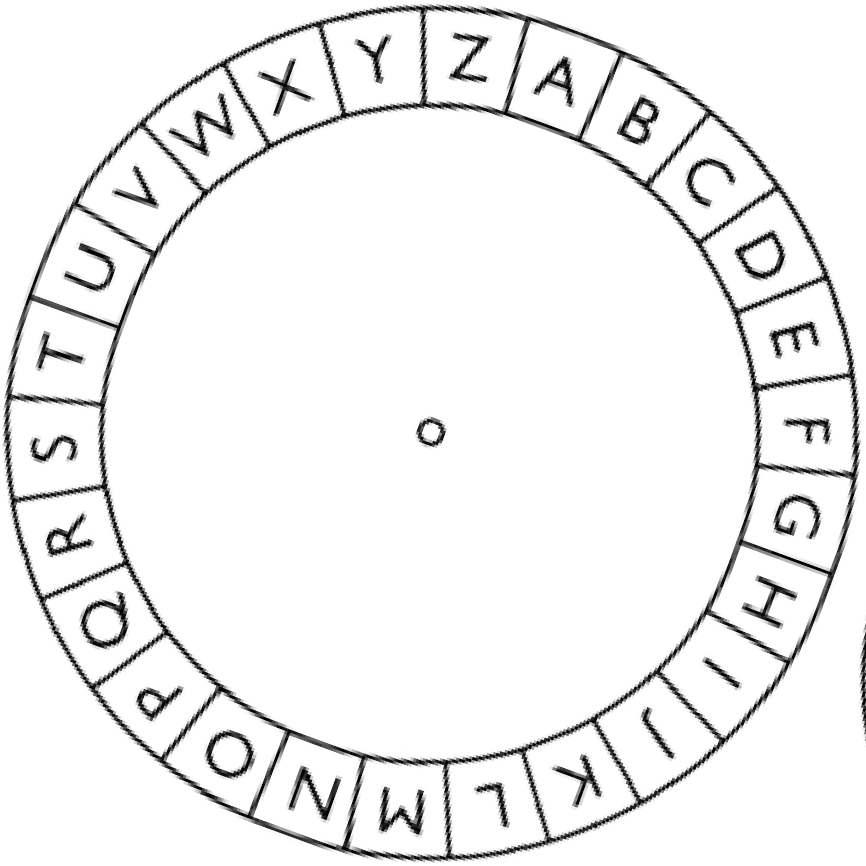
DECODING EXAMPLE:

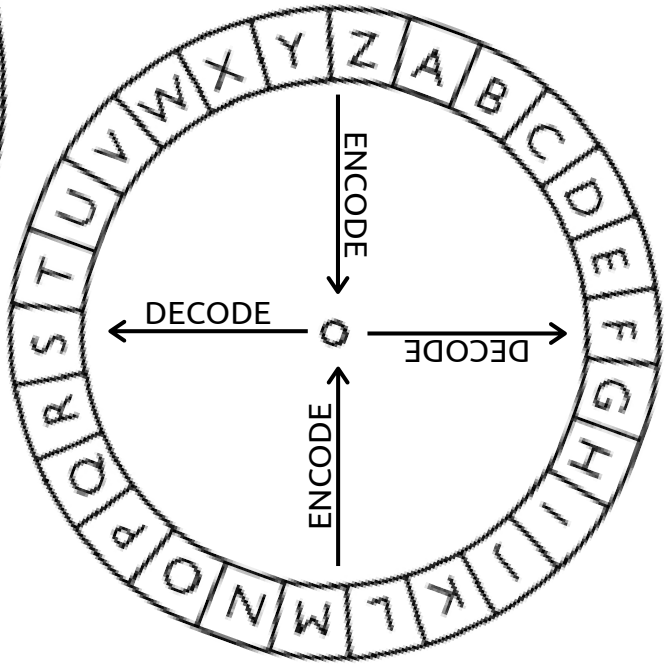
KEY: A → _

_ _ _ _ _

↓ ↓ ↓ ↓ ↓

_ _ _ _ _





YOUR CHALLENGE

Decode the following message in the blank space below:

xf tdl krikrej!

KEY: A → R

FINAL MESSAGE: _____ _____ _____ !

ACTIVITY 2: Binary Code

ASCII CHART: CHARACTERS TO BINARY

0	0011 0000	O	0100 1111	m	0110 1101
1	0011 0001	P	0101 0000	n	0110 1110
2	0011 0010	Q	0101 0001	o	0110 1111
3	0011 0011	R	0101 0010	p	0111 0000
4	0011 0100	S	0101 0011	q	0111 0001
5	0011 0101	T	0101 0100	r	0111 0010
6	0011 0110	U	0101 0101	s	0111 0011
7	0011 0111	V	0101 0110	t	0111 0100
8	0011 1000	W	0101 0111	u	0111 0101
9	0011 1001	X	0101 1000	v	0111 0110
A	0100 0001	Y	0101 1001	w	0111 0111
B	0100 0010	Z	0101 1010	x	0111 1000
C	0100 0011	a	0110 0001	y	0111 1001
D	0100 0100	b	0110 0010	z	0111 1010
E	0100 0101	c	0110 0011	.	0010 1110
F	0100 0110	d	0110 0100	,	0010 0111
G	0100 0111	e	0110 0101	:	0011 1010
H	0100 1000	f	0110 0110	;	0011 1011
I	0100 1001	g	0110 0111	?	0011 1111
J	0100 1010	h	0110 1000	!	0010 0001
K	0100 1011	i	0110 1001	'	0010 1100
L	0100 1100	j	0110 1010	"	0010 0010
M	0100 1101	k	0110 1011	(	0010 1000
N	0100 1110	l	0110 1100	)	0010 1001
				space	0010 0000

ACTIVITY 2: Binary Code

Convert your name into binary using the ASCII chart on the previous page!

YOUR CHALLENGE: Decode the following message back into English. The last word is your secret word!

01011001 01101111 01110101 00100000 01110011 01101111 01101100 01110110

01100101 01100100 00100000 01101101 01100101 00101100 00100000 01100011

01101111 01101110 01100111 01110010 01100001 01110100 01110011 00100001

MESSAGE:

ACTIVITY 3: Algorithm Sketch

Follow the video instructions as closely as possible, and draw your sketch below!

What are 3 better algorithm steps, or pieces of instruction, that would have made your picture look more like the example one?

1. _____
2. _____
3. _____

ACTIVITY 4: Live Debugging

Write your original shoe-tying algorithm steps here:

As you're testing, write 5 ways that you had to debug your algorithm, and make it more specific for the "computer" to follow.

1. _____
2. _____
3. _____
4. _____
5. _____

ACTIVITY 5: Algorithm Board Game

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	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	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	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	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	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	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
						★							

START EACH ROUND HERE

ACTIVITY 5: Algorithm Board Game

1.

```
MOVE FORWARD
MOVE FORWARD
TURN RIGHT
MOVE FORWARD
TURN LEFT
MOVE FORWARD
MOVE FORWARD
MOVE FORWARD
MOVE FORWARD
```

ENDING LETTER: _____

2.

```
LOOP 4 TIMES:
    MOVE FORWARD
TURN RIGHT
LOOP 6 TIMES:
    MOVE FORWARD
TURN LEFT
LOOP 6 TIMES:
    MOVE FORWARD
TURN LEFT
LOOP 4 TIMES:
    MOVE FORWARD
```

ENDING LETTER: _____

3.

```
MOVE FORWARD
MOVE FORWARD
TURN LEFT
MOVE FORWARD
IF ON D :
    TURN LEFT
    MOVE FORWARD
TURN LEFT
IF ON P :
    MOVE FORWARD
MOVE FORWARD
MOVE FORWARD
```

ENDING LETTER: _____

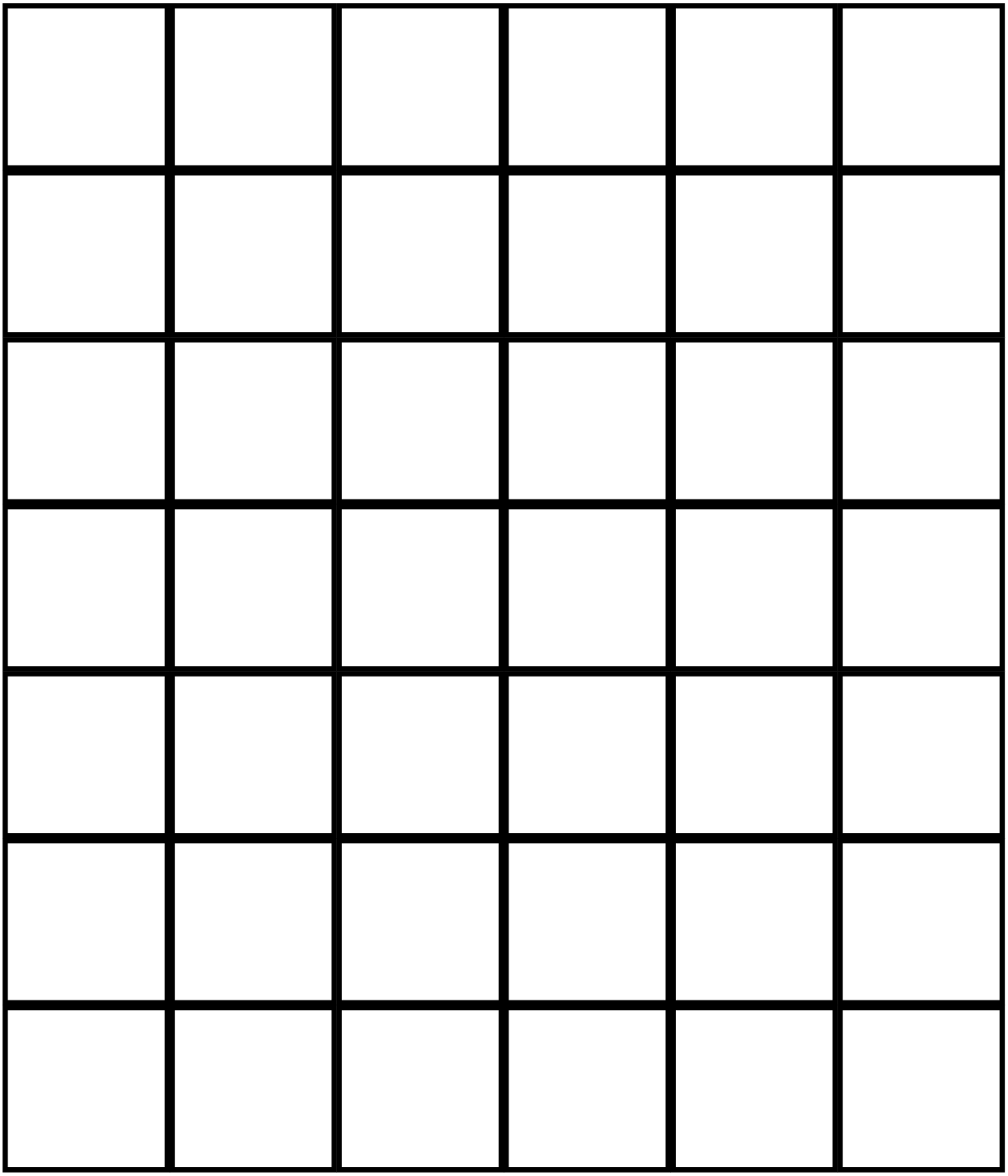
4.

```
LOOP 10 TIMES:
    MOVE FORWARD
TURN LEFT
LOOP 6 TIMES:
    MOVE FORWARD
IF ON E :
    TURN RIGHT
IF ON Q :
    TURN LEFT
MOVE FORWARD
```

ENDING LETTER: _____

COMPILED SECRET WORD: _____

GAME BOARD



ACTIVITY 6: Honeybee Game

Cut out these activity cards:

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

MOVE FORWARD

TURN LEFT

TURN LEFT

TURN LEFT

TURN RIGHT

TURN RIGHT

TURN RIGHT

LOOP ___ TIMES:

LOOP ___ TIMES:

ACTIVITY 7: Python Functions

1.

F01(▲):
    ● = 3
    ■ = ▲ + 2
    ★ = ■ - ●
    return ★

SOLVE: F01(4)

■ = ★ =

● = ▲ =

ANSWER: _____

2.

F02(●):
    ■ = 7
    ★ = ● + ■
    IF ★ = 11:
        ■ = 2
    ▲ = ★
    return ▲

SOLVE: F02(3)

■ = ★ =

● = ▲ =

ANSWER: _____

ACTIVITY 7: Python Functions

3.

F03(★, ■):

    ● = 2 x ■

    ■ = 4

    ▲ = ● + ★

    ♥ = ▲ - ■

    return ♥

SOLVE: F03(3, 5)

■ =

★ =

● =

▲ =

♥ =

ANSWER: _____

4.

F04(♥, ●):

    ■ = 6

    ▲ = ♥ + 2

    IF ▲ + ● = 11:

        ■ = 8

    ★ = ■ + ● - ♥

    return ★

SOLVE: F04(2, 7)

■ =

★ =

● =

▲ =

♥ =

ANSWER: _____

ACTIVITY 7: Python Functions

YOUR ANSWERS FOR #1 THROUGH #4
WILL REVEAL YOUR SECRET WORD!

IF YOUR ANSWERS WERE:		**SECRET WORD:**
#1: 2 #3: 9 #2: 17 #4: 11	→	STAMINA
#1: 3 #3: 9 #2: 17 #4: 13	→	EQUIPMENT
#1: 3 #3: 9 #2: 13 #4: 11	→	PROCESS
#1: 3 #3: 8 #2: 13 #4: 13	→	FORGETFUL

ACTIVITY 8: Vocabulary Review

Beside each definition, write the letter of the corresponding vocab word from this class!

___ 1. The input data values for a function

___ 2. To put into a code

___ 3. In a function, a "storage bin" that holds a value so it can be used in multiple calculations

___ 4. A command telling you to repeat certain steps of an algorithm

___ 5. The process of finding and fixing errors within computer code

___ 6. A device that can store and process data using logical operations

___ 7. When humans create specific instructions for how a computer should function, and communicate those instructions to the computer in a format that it understands

___ 8. One set of 8 binary digits

___ 9. A computer's middle step, where it interacts with inputted data before outputting new data

WORD BANK:

- **E - BINARY CODE**
- **F - BIT**
- **O - LOOP**
- **G - VARIABLE**
- **Q - RETURN**
- **V - PROGRAMMERS**
- **N - CONDITIONAL/IF**
- **M - PROCESSING**
- **T - CODING**
- **Y - ALGORITHM**
- **K - NESTED LOOPS**
- **S - INPUT**
- **P - FUNCTION**
- **L - ENCODE**
- **H - BYTE**
- **B - DECODE**
- **I - COMPUTER**
- **D - BINARY ALPHABET**
- **U - OUTPUT**
- **R - DEBUGGING**
- **A - PARAMETER**

this column spells out your activity 8 secret word!

FINAL CODING PUZZLE

STEP 1: TRANSFER ALL OF YOUR SECRET WORDS FROM EACH ACTIVITY HERE:

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________

STEP 2: FIND THOSE WORDS ON THE WORD SEARCH ON THE FOLLOWING PAGE, AND CROSS THEM OUT.

STEP 3: ON THE LINES BELOW, WRITE ALL OF THE LETTERS NOT CROSSED OUT ON THE WORD SEARCH, TO SOLVE THIS PROGRAMMING JOKE:

"How do you keep a programmer in the shower all day?"

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

"_ _ _ _ _ _, _ _ _ _ _ _, _ _ _ _ _ _ _"!

FINAL CODING PUZZLE

G S I T E T Y B T V

Z E W T A H E N M A

B Z O I T R E T A L

E O U F N M T L S H

A M P B P G G A O O

T H A I Z O S T N S

A Y U S R Z L E A S

T Q H I E R U R T I

E N T S E R E B P E

A H C O N G R A T S

M T S H O E L A C E

SOLUTIONS

Activity 1:
Phrase: "go cmu tartans!"
Secret Word: TARTANS

Activity 2:
Phrase: "You solved me, congrats!"
Secret Word: CONGRATS

Activity 3:
Secret Word: SWINGSET (from video)

Activity 4:
Secret Word: SHOELACE (from video)

Activity 5:
Answers: #1 B, #2 Y, #3 T, #4 E
Secret Word: BYTE

Activity 6:
Secret Word: BUZZBUZZ (from video)

Activity 7:
Answers: #1 3, #2 17, #3 9, #4 13
Secret Word: EQUIPMENT

Activity 8:
Answers: parameter, encode, variable, loop, debugging, computer, coding, byte, processing
Secret Word: ALGORITHM

Final Puzzle:
Resulting message: Give them a bottle of shampoo that says "lather, rinse, repeat"!