AACF Puzzle Week 2021

Master Score Report

	Mmbernie	MASSIVE!
Puzzle Raw Scores		
#1: The Matrix	50	50
#2: The Waterbending Scroll	50	50
#3: Nicknames	50	50
#4: Grapheme Fun	100	100
#5: Hammer Time	100	100
#6: Breakdown	150	150
#7: Space Time	150	150
#8: Azure Dreams	150	150
#9: Special Thanks	200	200
Subtotal:	1000	1000
Misc. Challenge Scores		
And so it begins…	10	10
Scoring	10	10
ALGAE	10	10
Registration	10	10
Teamwork	60	60
Subtotal:	100	100
First Solve Bonuses		
#1: The Matrix	5	
#2: The Waterbending Scroll	5	
#3: Nicknames		5
#4: Grapheme Fun	10	
#5: Hammer Time	10	
#6: Breakdown	15	
#7: Space Time		15
#8: Azure Dreams	15	
#9: Special Thanks	20	
Subtotal:	80	20
Hint Usage		
#1: The Matrix		
#2: The Waterbending Scroll		-10
#3: Nicknames		
#4: Grapheme Fun		
#5: Hammer Time		-10
#6: Breakdown		-10
#7: Space Time		
#8: Azure Dreams		
#9: Special Thanks		-10
10 Initial hints	100	100
Subtotal:	100	60
Puzzle Raw Scores	1000	1000
Misc. Challenge Scores	100	100
First Solve Bonuses	80	20
Hint Usage	100	60
Team Penalties		
Final Score	1280	1180
Final Rank	1	2

AACF Puzzle Week 2021

January 28 – February 5, 2021

- This packet contains one puzzle per page, all of which are independent of one another.

- The answer to each puzzle is a single word or name (person, company, etc.) in English.

- You may use the Internet and any other resources at your disposal. Internet tools and services will be required for some problems.

- You will be working together to compete against other teams.

- Submit your answers to the online autograder at puzzlehunt.tech. More details about scoring can be found on the site.

- Good luck and have fun!

#1: The Matrix

Raining green letters
Strange symbols flash on your screen
A dog stares at you

Answer: _____

#2: The Waterbending Scroll

Ancient form of art
Dancing men bending water
Form is critical

Answer: _____

#3: Nicknames

*Taking attendance
in your wind symphony class
What are their real names?*

Roster

1)   _ _ _ _ _ _ _ _ _ _ _ _ _
                                1

2)   _ _ _ _ _ _ _ _ _ _ _
         8   3

3)   Joe Biden

4)   _ _ _ _ _ _ _ _ _ _ _ _ _ _
                                4

5)   _ _ _ _ _ _ _ _ _
              9

6)   _ _ _ _ _ _ _ _ _ _
           5

7)   Doug Jones

Answer: _____

#4: Grapheme Fun

Letters create words
Which form sentences and more
Language is so smooth

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

Stage 1: 2 (11) 7 2 (9) 5 1 9
(7) 1 10 4
7 2 10 10 2 (9) (10)

Stage 1   Not Stage 1

Answer: (3) (5) (4) (6) (1) (11) (4)

Answer: _____

#5: Hammer Time

Blue and gold signage
What do I need to purchase?
Assembly required

PELCO

BORVIK

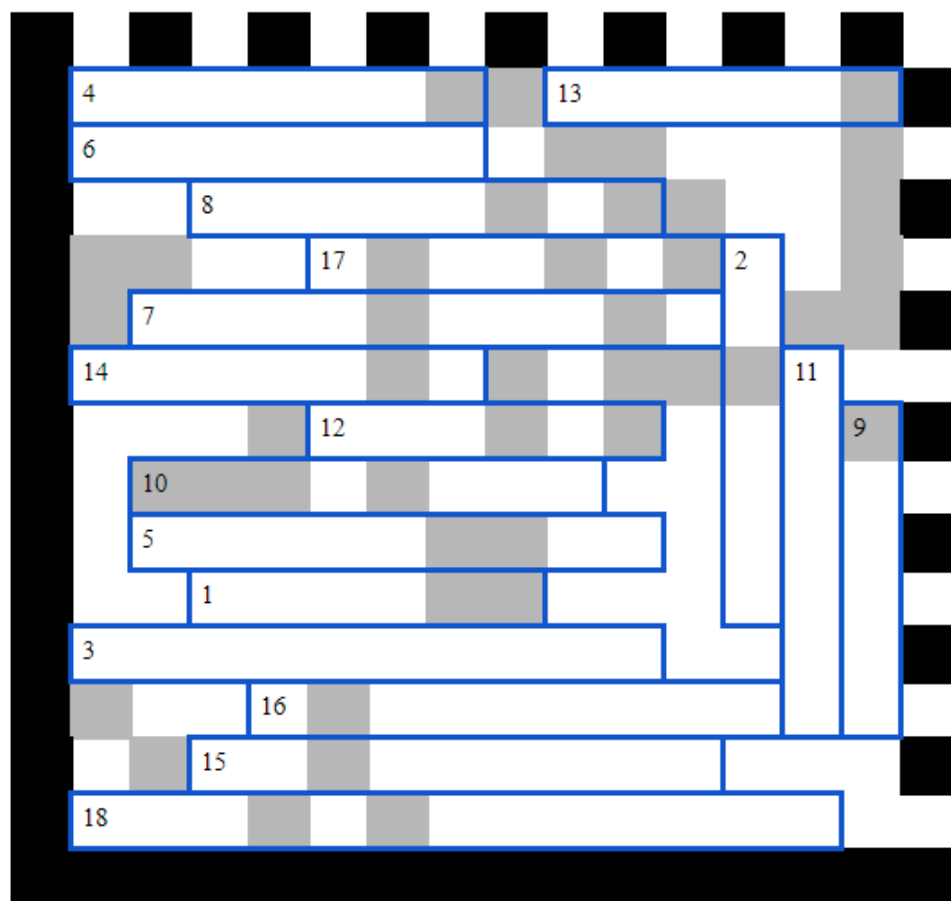LUNDVED

RENSTA

KNARTEVIK

KRISTRUT

YURA

SUPFLETT

BENGSTA

Answer: _____

#6: Breakdown

Amelia dressed
the chicken with bright green cloth
Oh Amelia

: A, B, C, D, F, K, L, M, P, V, W, X, Y

1) To remove pennies
2) To get wounded by a bee again
3) Formal pieces of neckwear
4) Vocalizing a sharp or flat tune
5) The northern alcid protagonist of *Earthbound*
6) A collection of 3 small glass containers
7) Favoring a large farm vehicle
8) Ordered collection of thoughts
9) Having one male child

10) Tiny water droplets creating reddish brown oxide
11) Similar to thin pancake dough material
12) Former cloth dwelling
13) Two male sovereign rulers
14) Epoch of disarray
15) Female religious members beating an instrument together
16) A polite man who immerses himself under water
17) An arrow shooter that is small/young/inferior
18) Sturdy construction material binding him, her, and them

Answer: _____

#7: Space Time

Who can be captured?
Past pieces cannot be moved
White can time travel

EXAMPLE ✓

TIME

EXAMPLE ✗

TIME

PRESENT
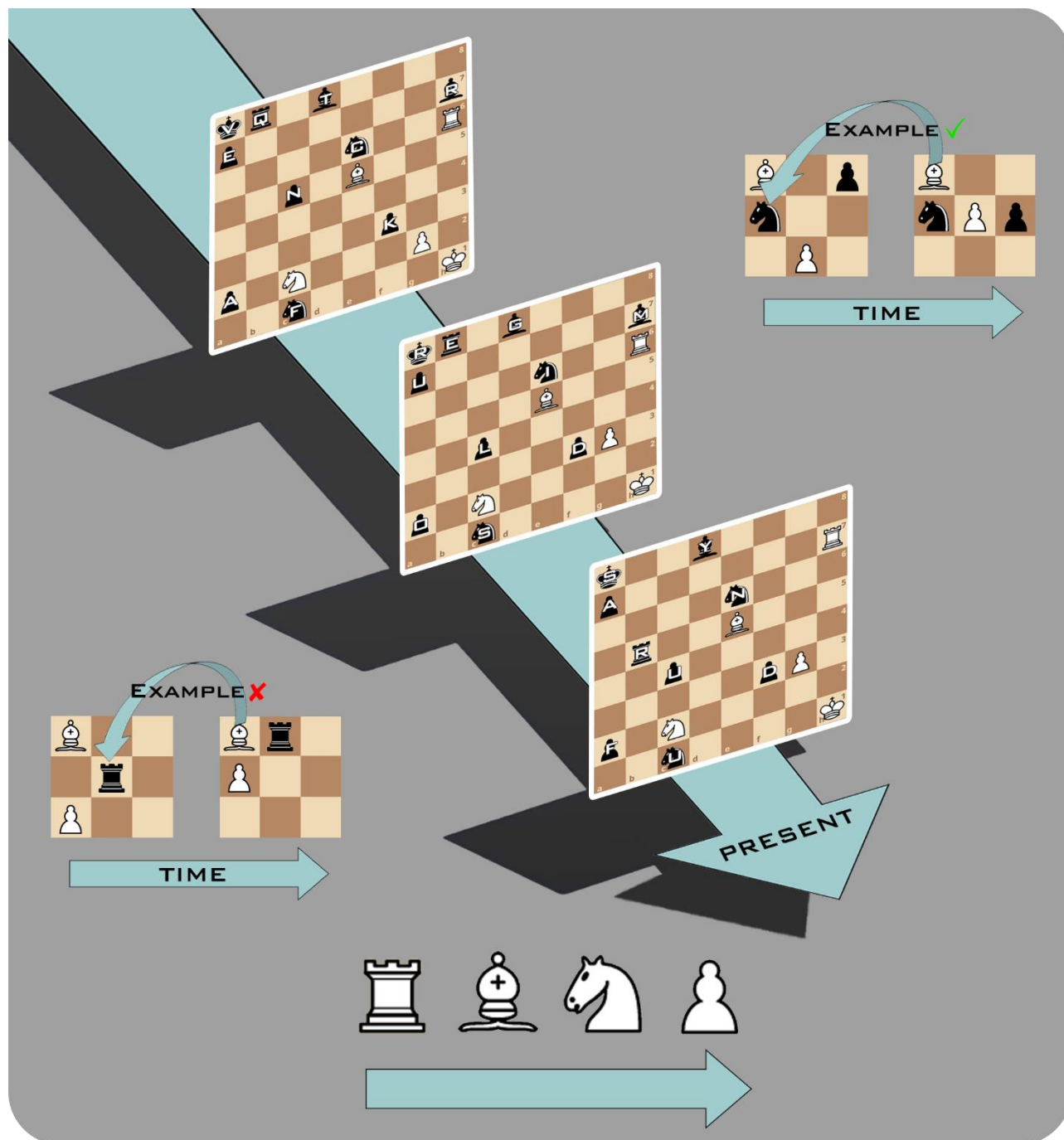
Answer: _____

#8: Azure Dreams

True luminaries
Where in the world are they now?
The sky's the limit

1)   Louis Armstrong

2)   Ben Douglas

3)   Medgar Evers

4)   Billy Mitchell

5)   Ronald Reagan

6)   Jesse Viertel

Final clue:

Answer: _____

Special Thanks

Thanks to all beta testers for this year's puzzle hunt! This year's goal was to make the puzzles more enjoyable by making them more balanced and by including a variety of difficulty. Many were too complex at first; puzzles and clues often went through many iterations over the months, so their help was invaluable. Here are some comments/remarks that the beta testers wanted to leave /pass on to you guys!

"_ _ _ _ _"
- Nicole Xin

3 people found this helpful.

Matt: Thanks, that means a great deal!

"_ _ _ _ _"
- Alvin Xu

1 person found this helpful.

Matt: Thanks, that means the world!

"Benevolent"
- Anonymous

5 people found this helpful.

Matt: Thanks, that is very kind!

"_ _ _ _ _ _ _"
- Sophia Wang

4 people found this helpful.

Matt: Thanks, that means more than you can possibly imagine!

"_ _ _ _ _ _ _"
- Mandy Yee

3 people found this helpful.

Matt: Thanks, that means a lot!

"_ _ _ _ _ _ _ _"
- Chun Wa Wang

1 person found this helpful.

Matt: Thanks, I know you mean well!

Answer: _____

Appendix: Special Thanks

The meta puzzle #9: Special Thanks requires online elements of the website to be solved. All relevant pages are included in this appendix.

Putting it all together

The end of the trilogy.

Answers # and # are types of /_ _ _ _ _ _.

Answers # and # are /_ _ _ _ _ _ _ _ _ bodies.

Answers # and # are related to similar versions, but not / _ _ _ _ _ _ _ _ _.

Answers # and # can be / _ _ _ _ _ _ _ _ _ _ into 3 words.

tech / [   ]-[   ]-[   ]-[   ]

Fig. 1. https://puzzlehunt.tech/review

Graphs
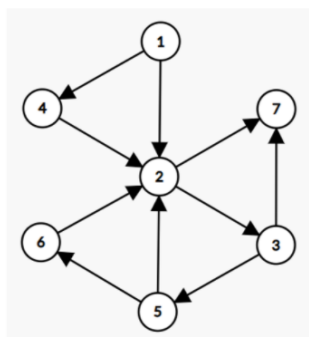
Remove cycles, what remains?

Fig. 2. https://puzzlehunt.tech/graphs

Celestial

? M V E M J S ...

Full name of ?

Fig. 3. https://puzzlehunt.tech/celestial

AACF Puzzle Week 2021 Rules Users Teams Challenges 🔧 Admin Panel 🔔 Notifications 👥 Team 👤 Profile ⚙ Settings ⎋

Identical

Puzzle #8s

What do both involve?

Fig. 4. https://puzzlehunt.tech/identical

AACF Puzzle Week 2021 Rules Users Teams Challenges 🔧 Admin Panel 🔔 Notifications 👥 Team 👤 Profile ⚙ Settings ⎋

Decomposed

Three 3-letter titles

2:2

3:6

2:10

Fig. 5. https://puzzlehunt.tech/decomposed

The Final Step

Fig. 6. https://puzzlehunt.tech/dag-sun-map-tri

AACF Puzzle Week 2021 Solutions

#1: The Matrix

1. Notice the rotational symmetry for each symbol. That is because it is formed by 4 identical copies of a letter, each rotated $90°$.

2. The corgi looks at you with its head tilted at $\approx 45°$, leading you to do the same to read the letters

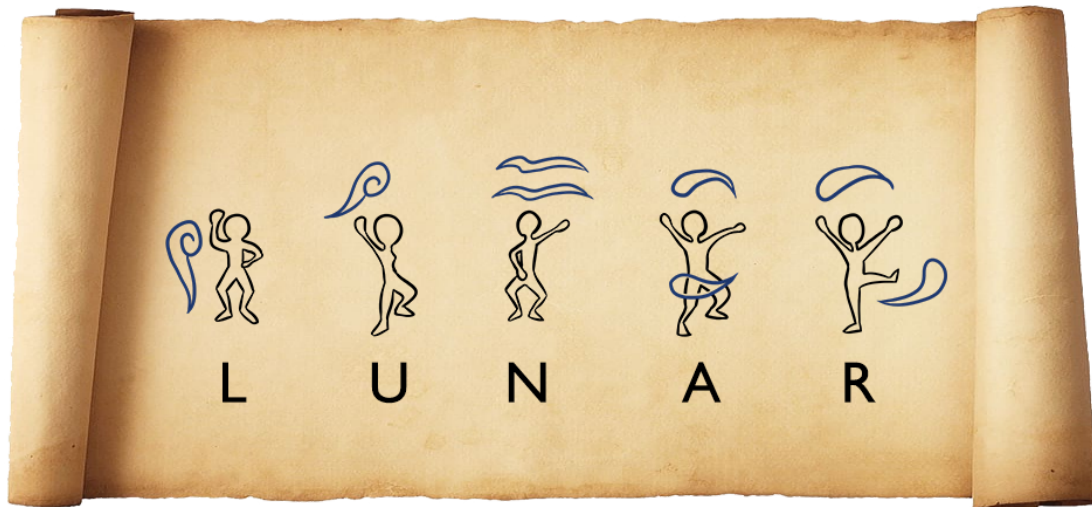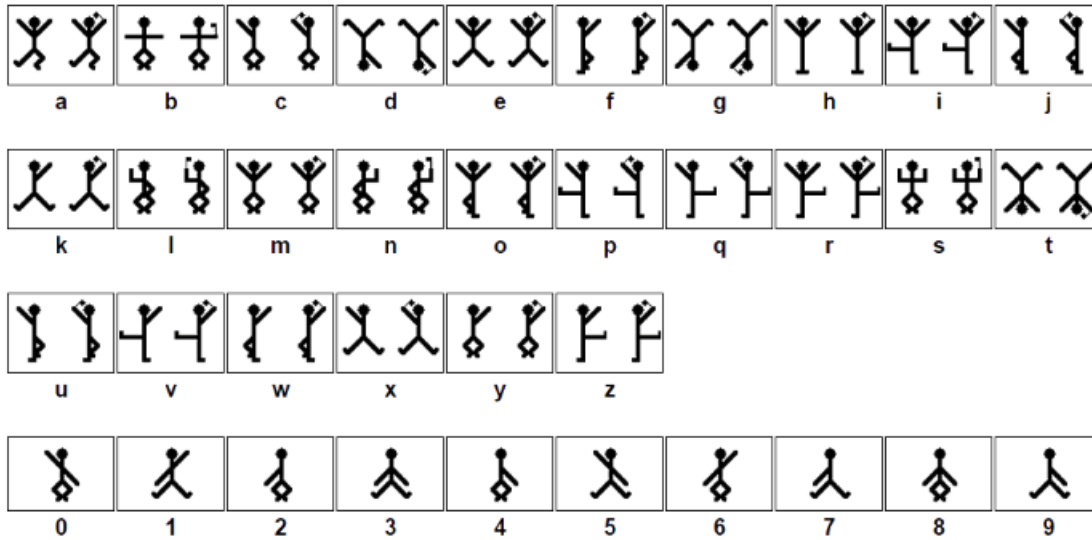Note: The background green matrix text is just for the theme of the problem.

ANSWER: `CLIQUE`
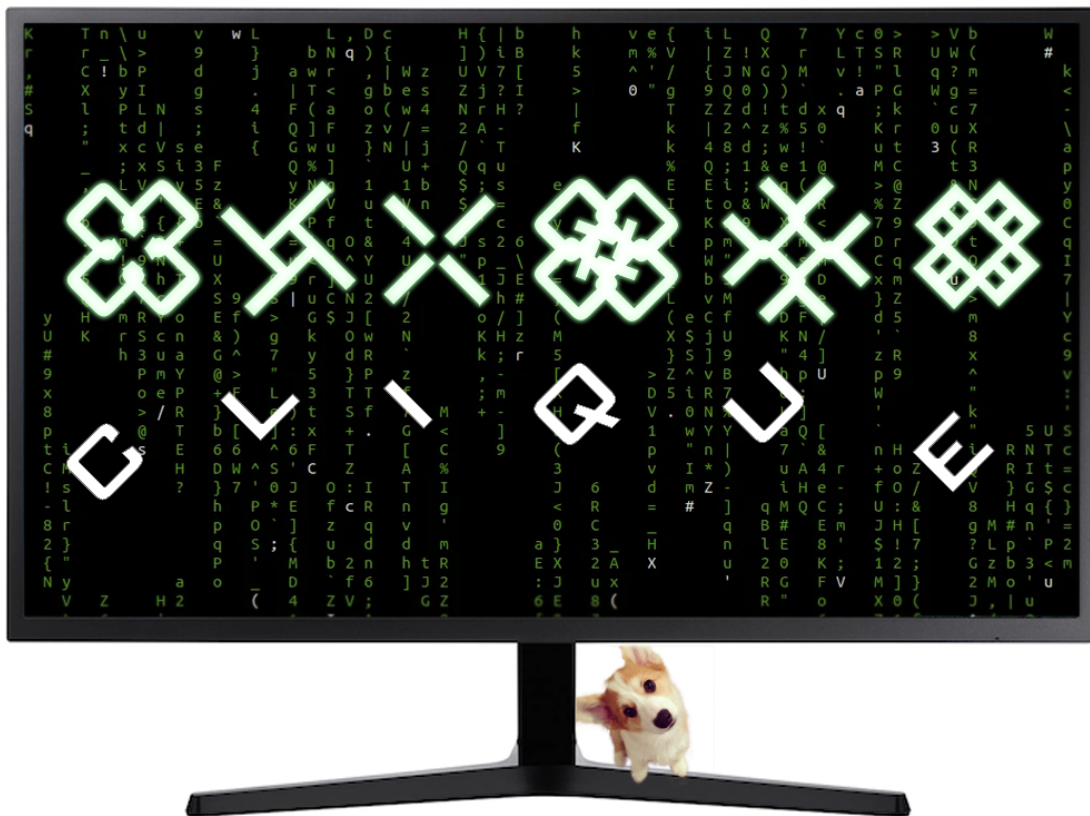
#2: The Waterbending Scroll

1. The haiku hints about "dancing men" leading to the dancing men cipher (from Sherlock Holmes)
2. Each figure corresponds to a letter when decoded using the dancing men cipher, spelling out LUNAR

ANSWER: LUNAR

#3: Nicknames

1. Some real names and some nicknames are given. The goal is to figure out whatever is missing. The given names are politicians.
2. Wind symphony alludes to trumpets. These are all nicknames made by Trump.
3. Using this (https://en.wikipedia.org/wiki/List_of_nicknames_used_by_Donald_Trump) wikipedia page, all of the nicknames/real names can be filled in.
4. Arranging the selected letters from the filled in names spells out SOBRIQUET

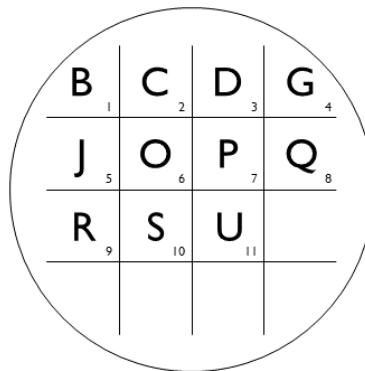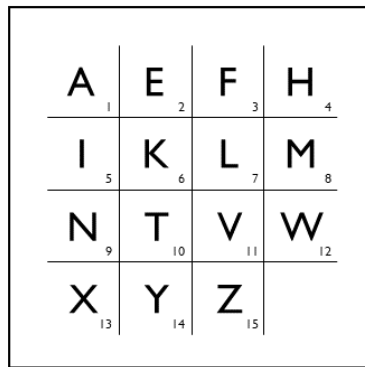| Number	Real Name	Nickname
1	Randolph Alle**s**	Dumbo
2	Hunt**e**r **B**iden	Where's Hunter
3	Joe Biden	**Qu**id Pro Joe
4	Michael Bloombe**rg**	Mini Mike
5	John Bol**t**on	Mr. Tough Guy
6	Bill Cl**i**nton	Wild Bill
7	Doug Jones	Puppet J**o**nes

ANSWER: SOBRIQUET
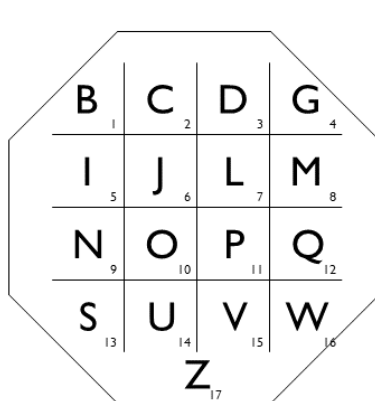
#4: Grapheme Fun

1. The alphabet is listed out in the font of the puzzle to avoid font ambiguities
2. In stage 1, the goal is to figure out how to classify the letters as either square or circle. This is hinted at by the shapes themselves. Letters with rounded arcs belong in the circle.
3. Stage 1 answer spells out EULERIAN PATH LETTERS
4. In stage 1, the goal is to figure out how to classify the letters as either octagon or pentagon. Octagons are letters that are stage 1 answer, pentagons are letters that are not stage 1 answer
5. An Eulerian Path is a path that visits each edge exactly once (in graph theory). Eulerian path letters are ones that can be traced in a single stroke (without lifting up your pencil). This spells out DIGRAPH

ANSWER: DIGRAPH

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 1	E 2	F 3	H 4
I 5	K 6	L 7	M 8
N 9	T 10	V 11	W 12
X 13	Y 14	Z 15	

B 1	C 2	D 3	G 4
J 5	O 6	P 7	Q 8
R 9	S 10	U 11	

Stage 1: E (U) L E (R) I A N
(P) A T H
L E T T E (R) (S)

B 1	C 2	D 3	G 4
I 5	J 6	L 7	M 8
N 9	O 10	P 11	Q 12
S 13	U 14	V 15	W 16
Z 17			

A 1	E 2	F 3	H 4
K 5	R 6	T 7	X 8
Y 9			
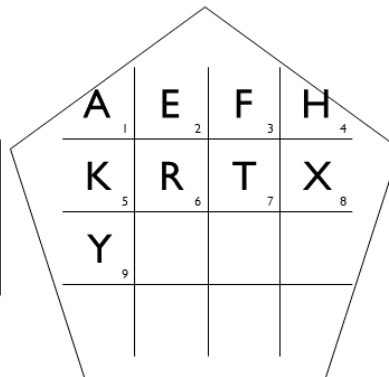
Stage 1   Not Stage 1

Answer: (D) (I) (G) (R) (A) (P) (H)

#5: Hammer Time

1. The haiku alludes to IKEA (blue and gold signage → IKEA logo, assembly required → you have to build the furniture yourself).
2. When searching in the IKEA catalog, notice that all listed words are off by 1 character. Extracting all the "wrong" letters spells out `COUNT TYPE`
3. Count by type and listing in order as originally given. (Note: Sometimes the names corresponded to multiple types of items. Ex. `KURA` also was a `REVERSIBLE BED`, but the solution is obtained using types that allow for the greatest amount of aggregation)
4. We can now use the counts to index into the type. This spells out `MINDE`
5. The haiku asks what we want to buy. Looking up `MINDE` on IKEA, that means mirror, so the final answer is `MIRROR` (Note: all answers were specified to be in English, so `MINDE` was not accepted)

ANSWER: `MIRROR`

Given Name	Real Name	Type	Extracted Letter
PELCO	PELLO	Armchair	C
BORVIK	BURVIK	Side table	O
LUNDVED	LINDVED	Side table	U
RENSTA	REMSTA	Armchair	N
KNARTEVIK	KARREVIK	Nightstand	T
KRISTRUT	KRISTRUP	Door mat	T
YURA	KURA	Bed tent	Y
SUPFLETT	SUFFLETT	Bed tent	P
BENGSTA	BINGSTA	Armchair	E

Type	Count	Extracted Letter
Armchair	3	m
Side table	2	i
Nightstand	1	n
Door mat	1	d
Bed tent	2	e

#6: Breakdown

1. Haiku is a reference to Amelia Bedelia (a children's book, can be easily found on Google). Amelia interprets instructions literally, so you must interpret each of the 18 phrases literally. Each phrase corresponds to a real English word that is the result of 2 or 3 words put together.
2. Each word can be filled in in the grid above. The puzzle suggests that A, B, C, D, F, K, L, M, P, V, W, X, Y should all be shaded in (as well as the given gray squares)
3. The grid is actually a 2D data matrix which can be scanned using a phone app or an online service (like a QR code) which gives `girlbelowonfeet`
4. This final phrase is a clue which can be decomposed into `girl below on feet` which leads to `misunderstand`

   Answer: `MISUNDERSTAND`

Num	Clue	Answer
1	To remove pennies	decent
2	To get wounded by a bee again	resting
3	Formal pieces of neckwear	properties
4	Vocalizing a sharp or flat tune	missing
5	The northern alcid protagonist of Earthbound	puffiness
6	A collection of 3 small glass containers	trivial
7	Favoring a large farm vehicle	protractor
8	Ordered collection of thoughts	idealist
9	Having one male child	unison
10	Tiny water droplets creating reddish brown oxide	mistrust
11	Similar to thin pancake dough material	battery
12	Former cloth dwelling	extent
13	Two male sovereign rulers	biking
14	Epoch of disarray	message
15	Female religious members beating an instrument together	conundrum
16	A polite man who immerses himself under water	divergent
17	An arrow shooter that is small/young/inferior	bowling
18	Sturdy construction material binding him, her, and them	pronouncement
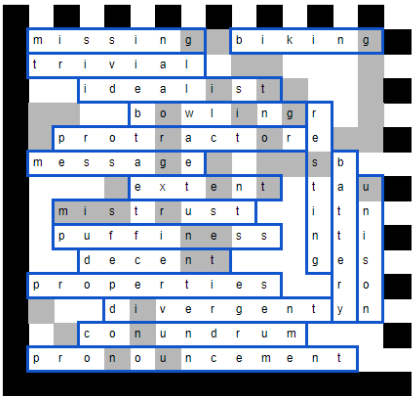
#7: Space Time

1. The main idea is that white pieces can travel in time as the 4th dimension. We can extraploate how chess pieces work in more than 2 dimensions.

2. The puzzle hints that we want to find pieces that can be caputed by white, and order them by the order given and from earliest in time to present.

3. This spells out `MANIFOLD`

ANSWER: `MANIFOLD`

Chess Piece	2D Movement	Generalized Movement
Rook	Move any number of squares vertically or horizontally	**Move any number of squares in a single spatio-temporal dimension** until obstructed. This ends up being a single spatial or single temporal dimension.
Bishop	Move diagonally any number of squares	**Move any number of squares in exactly two spatio-temporal dimensions** until obstructed. The number of squares moved in each dimensions must match. This ends up being two spatial dimensions or 1 spatial and 1 temporal dimension.
Knight	Move in an L shaped pattern (2, then 1 or 1, then 2)	**Move exactly 2 squares in one spatio-temporal dimension and move 1 square in a different spatio-temporal dimension.** The path can be obstructed. This ends up being two spatial dimensions or 1 spatial and 1 temporal dimension.
Pawn	Move 1 square forward, or 1 diagonal if capturing a piece.	**Move exactly 1 square in one spatio-temporal dimension or exactly 1 square in two spatio-temporal dimensions if capturing.** The path cannot be obstructed for the first action. The second action ends up being two spatial dimensions or 1 spatial and 1 temporal dimension.

The movement rules can also be generalized for kings and queens, but are omitted for simplicity.

#8: Azure Dreams

1. After googling the people, you may realize that they all have US airports named after them.
2. Filling out the 3 letter airport codes for each and reading the rainbow letters shaded boxes in order gives ASTRAL
3. Place all airport locations on a map. This forms the constellation LIBRA

ANSWER: LIBRA

Num	Full Name	Airport Code
1	Louis Armstrong	M **S** Y
2	Ben Douglas	C **L T**
3	Medgar Evers	J **A** N
4	Billy Mitchell	M K E
5	Ronald Reagan	D C **A**
6	Jesse Viertel	V E **R**
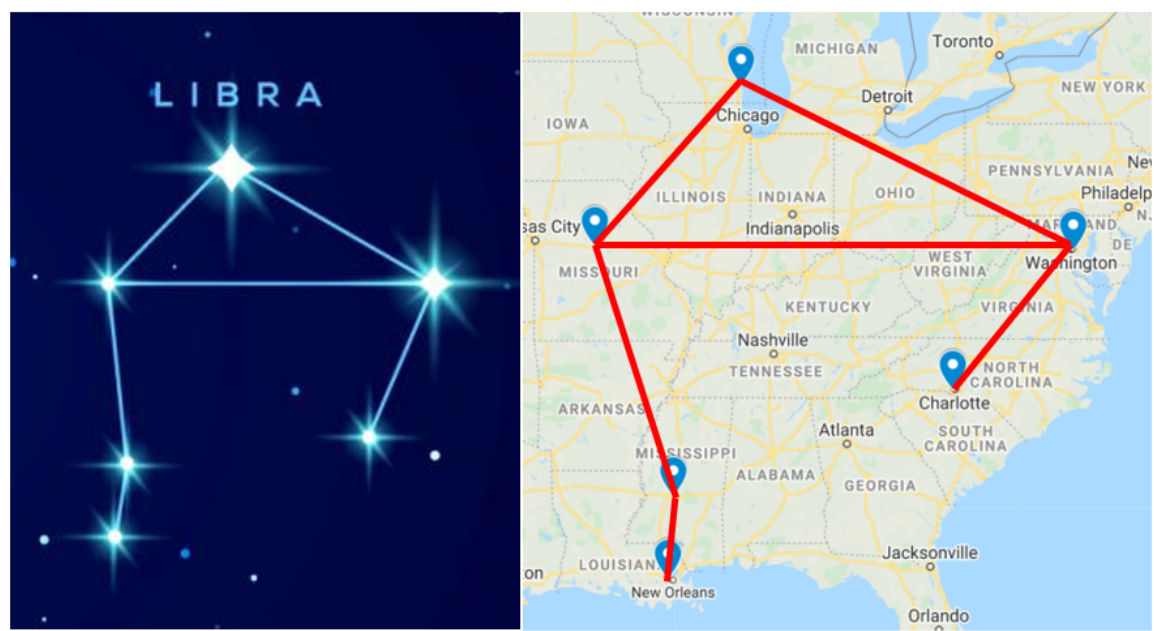
#9: Special Thanks

1. Note that the instructions said `This packet contains one puzzle per page`. The special thanks is page 9 and there is an answer blank there too!
2. Reading the first letters of the text blurb vertically spells out `tech/`
3. Fill out the rest of the comments using Matt's reply as a clue. One is given as an example. The comments are single words that are puns with the obvious meaning being stated by Matt's reply.
4. Extract using the indicies as the number of helpfuls. This gives `REVIEW`.
5. Combining this with the previous message, it spells out `Go to /review`, telling you to go to `/review` on the puzzle site `https://puzzlehunt.tech/review`
6. This part of the puzzle uses previous answers. Previous answers can be paired together by a common idea. Once you figure out the common idea, you go to that page on the website.
7. The first one is at `/graphs`. The flavortext says to remove cycles. The nodes remaining are `4 1 7` and converting that from numbers to letters gives `dag` (which means Directed Acyclic Graph in graph theory)
8. The second one is at `/celestial`. The flavortext spells out `? M V E M J S …` which are planets, the first `?` is the `sun`
9. The third one is at `/identical`. The flavortext asks `Puzzle #8s, What do both involve?` This references 2020's #8 which has to do with a pokemon map and 2021's #8 which uses a US map of airports. Thus the word here is `map`
10. The fourth one is at `/decomposed`. The flavortext asks about 3 letter titles. This references 2019's #4: `A Strange Inscription`, 2019's #8: `Shorter is Better`, 2021's #2: `The Waterbending Scroll`. Indexing into the titles using `word:letter` in chronological order gives `tri`
11. Putting this all together we need to go to `/dag-sun-map-tri` on the puzzle site
12. This is the final part of the puzzle. It contains a circle with letters. Notice that the circle border is very similar to the logo border. Overlaying the logo shows letters within the lines of the logo. Reading this clockwise starting from the top spells out `ANS PAEAN`

ANSWER: `PAEAN`

Person	Comment	Helpfuls	Extracted
Nicole Xin	Bargain	3	R
Alvin Xu	Earth	1	E
Anonymous	Benevolent	5	V
Sophia Wang	Infinity	4	I
Mandy Yee	Plethora	3	E
Chun Wa Wang	Water pit	1	W

Number	Answer	Notes
1	CLIQUE	In graph theory, a clique is a subset of vertices of an **undirected graph**
2	LUNAR	References the moon, **a celestial body**.
3	SOBRIQUET	Means a nickname, which is **a similar version but not identical**
4	DIGRAPH	A digraph is a **directed graph**
5	MIRROR	A mirror produces a flipped version, which is **a similar version but not identical**
6	MISUNDERSTAND	Can be **decomposed into 3 words**: miss, under, stand
7	MANIFOLD	Can be **decomposed into 3 words**: man, I, fold
8	LIBRA	References stars, which are **celestial bodies**

Answers 1 and 4 are types of / g r a p h s

Answers 2 and 8 are / c e l e s t i a l bodies.

Answers 3 and 5 are related to similar versions, but not / i d e n t i c a l.

Answers 6 and 7 can be / d e c o m p o s e d into 3 words.

tech / | dag |-| sun |-| tri |-| map |