

Dimensional Analysis

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Warning: This document contains spoilers for this room. Do not read past this point if you wish to play this room!

INTRODUCTION & CONTENTS

Thanks for downloading and reading this escape room. This is probably the easiest of the three I've created to run, but it has the hardest puzzles, because why would I make things easy for myself?

I ran this for Bill & Dani, and then I noticed some minor errors in the room. The handouts and descriptions that you're seeing is not exactly what Bill & Dani saw, but a fixed version, so that what you see will work.

That being said, this is a room that I've been running off an outline and improvising as I go. You can see this in some puzzles (the walkie-talkie, the frog) where there was lots of little interactions that I was improvising rather than scripting out. Therefore, even more so than usual, feel free to treat all of the text as guidelines rather than hard and fast rules.

While this room only has 9 puzzles, each of those puzzles are harder than the average puzzle in my other two rooms. This room really benefits from you understanding how the puzzles work so you can respond appropriately to how the players are doing. The GM's Explanation is probably the best section here. Of course, listening to the episode will also be helpful here.

I've tried doing something slightly different with the layout. Instead of breaking it into descriptions & actions, I've created boxes where everything related to one object is listed. Hopefully this helps with intuitively understanding what's going on. Let me know if this helps you.

If you do run it, feel free to contact me and let me know how it went! I'm on the CtM Discord server as Jen McTeague, I'm on Twitter as @mersiamnot, and my email is iammars21@gmail.com. Good luck!

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INTRODUCTION

You see your target up ahead - THE MUSEUM OF CULTURAL HISTORY. Despite that being its name, it wasn't very good at history. The museum was pretty famous for stealing cultural artifacts all across the galaxy, assuming they knew the use of the item better than the cultures they took them from, and then displaying it for people to gawk at. You'd be tempted to vandalize it while you're here, but you're a professional. Get in, get your target, get out.

You open the door with a stolen key card and let loose a fog canister to reveal the lasers on the ground. You tiptoe through the lasers like an expert because, well, you are. You're the best jewel thief in the business, which is why Ambassador Fishkulp hired you to retrieve this item. The ambassador implied that the museum really didn't know what they had, and it was potentially dangerous to everyone. They had tried to ask the museum for it back, but the museum was as dismissive as they usually were, so they weren't hearing it.

You make it to the back of the museum, in front of a door with a sign that says "Repair Room". If your intelligence is correct, the item was moved here to protect it against exactly what you were doing. You are uncharacteristically a little nervous before opening the door. Partially this is because no one was able to help you get a good layout on the room before going in, and partially because the Ambassador warned you that the item might try to "help" you, air quotes and all. You open the door, and your eyes are immediately brought to the guard on the other side of the room. "Freeze!" they call out. You put your hands up, and then all of the sudden a bright flash of light erupts from the center of the room, blinding you.

Once your eyes recover from the flash of light, you take stock of the room you find yourself in. The **guard** who was about to attack you is now on the ground in front of the **north door**. In the northeast corner of the room you see some sort of **alien board game** set up on a pedestal. In the middle of the east wall is an **arcade game**, and between the two is a **glass cube with various symbols**. In the southeast corner is a **metallic grandfather clock**. In the southwest corner is a **robotic frog** on another pedestal. In the middle of the west wall is a **series of lockers**, and between the lockers and the frog is **another alien board game** set up on a pedestal. In the northwest corner is a **tesseract** with metal corners, and immediately to its right is a series of **lighted buttons**.

But perhaps most importantly, you spot the item you're looking for in the middle of the room resting in a glass case. The item is shaped like an ocarina with five unlit light bulbs on top. You look at the unconscious guard. While that was helpful, if that is only the start of the item's "help", you're quite worried about what else this thing can do.

A NOTE ABOUT TIME

Time is abstracted in this room and depends on what the solvers do. There are various actions in the room that have a [🕒] next to them. These actions add one to the current time. Time starts at T+0 and progresses to T+1, T+2, T+3, T+4 and finally T+5. Teams cannot perform any actions at T+5, but they should have long enough to see the results of previous actions. This includes seeing the holo-arcade game boot up, seeing where the frog jumped, seeing what time the grandfather clock is showing, and seeing if the password they just put in works.

When it hits T+5, the room resets. This causes the room to be reset to the beginning. Players still have knowledge of what happened in previous rooms (and therefore they can still look at any handouts they've seen), but everything they have done is undone. The exception to this is if the five actions have been putting in the four passwords on the central pedestal and using the key on the central pedestal.

ITEMS

23 Lights

Description—This exhibit contains 23 buttons which can be lit or unlit. A sign underneath indicates that this was a numbers game for the children on the planet Disuevis, but the output screen seems broken. It's showing random letters instead of numbers.

(Show the solvers the 23 Lights Handout)

Animal Cube

Description—This clear glass cube has various animals on the outside and the inside of it. The plaque at the bottom says that it was used to teach children from the planet Upra how to find distance, but it was eventually taken out of use because students kept accidentally squaring things.

(Show the solvers the Animal Cube handout)

Arcade Game

Description (before it's plugged in)—This looks like a fairly standard holo-arcade game, with a holographic projector at the top, and a panel of buttons on the side to use as your controls. It's currently off.

Description (as it's booting up)—This looks like a fairly standard holo-arcade game, with a holographic projector at the top, and a panel of buttons on the side to use as your controls. It's currently booting up.

Description (in the time after T+5 if it was plugged in on T+0)—This looks like a fairly standard holo-arcade game, with a holographic projector at the top, and a panel of buttons on the side to use as your controls. The projector is projecting the words "Eneja Higgenstrom: Finder of Stars" in the air.

[🔍] Searching for a Power Source/On Switch—Oh, it looks like someone forgot to plug it in. You reach behind the machine and plug it into the outlet on the wall. The machine starts booting up.

Axis & Allies Set

Description—This looks like a fairly standard Axis & Allies set. A plaque underneath it states "This is an old board game recovered from the ruins of Ancient Earth. The map is an accurate representation of what it looked like before the planet flooded, and the war-like theme shows how they trained their kids in military strategy even at a young age."

(The set is open and the players can investigate it from the beginning of the room. Be vague about what it contains, although solvers should feel free to look up Axis & Allies sets online to get a sense of the pieces. At the end, they will need an airplane piece from the game. Make them be specific about which piece they are looking for.)

Central Pedestal

Description—This central pedestal contains the ocarina-like object at the top, which has [X] of its light bulbs lit up. The ocarina-like object is in a glass case, which is locked with a key lock. The lock seems to take a weird conical key, but it's not your biggest concern at the moment because the lock is covered with a different glass box. On the pedestal there is a touchscreen which contains a QWERTY keyboard. It says "Password 1/4" on it.

[🕒] **Putting in a wrong password**—The screen flashes, and the screen says "Incorrect password" on it.

[🕒] **Putting in a password in the wrong order**—The screen flashes, and the screen says "Please put passwords in the correct order" on it.

[🕒] **Putting in AXIS for Password 1**—The screen flashes, and then it says "Password 2/4" on it.

[🕒] **Putting in PLANE for Password 2**—The screen flashes, and then it says "Password 3/4" on it.

[🕒] **Putting in HOLDS for Password 3**—The screen flashes, and then it says "Password 4/4" on it.

[🕒] **Putting in CHRONOLOGICAL for Password 4**—The screen flashes, and then it lists all 4 passwords on it in order with the word "ESCAPE" afterwards. The box covering the small key lock on the box opens up.

[🕒] **Putting an Axis Plane in the key lock**—Go to conclusion!

Grandfather Clock

Description—This is a metallic recreation of an old analog grandfather clock. It looks nice, although quite unnecessary. It would also be better if it told the correct time. It current reads [time], which definitely isn't correct.

[time] T+0 - 12:00
T+1 - 1:10
T+2 - 4:25
T+3 - 9:45
T+4 - 5:10
T+5 - 2:40

Guard

Description—This guard seems to be out cold. You have no clue what that blinding flash did, but it was certainly was effective. The guard is wearing a uniform with a nametag that says "Aercel". In addition, there is a digital **walkie talkie** on the guard's belt with buttons to contact the three other guards.

Guard Lockers

Description—This set of four lockers each have a touchscreen on them. They are numbered from 1 to 4.

Locker #1 Screen - Description—This screen has a QWERTY keyboard with and a place to enter a password. There is a password hint button off to the side.

[🕒] **Locker #1 Screen - Password Hint**—The password hint says “Best friend's pet + planet lived on + year born”.

[🕒] **Locker #1 Password - Wrong password**—The screen flashes and then says “Wrong Password”.

[🕒] **Locker #1 Password - CAPYBARAQUINTAXIS3714**—The locker opens up, and inside the locker are a bunch of street clothes (that aren't relevant) and a steel panel. *(Show the solvers Panel #1)*

Locker #2 Screen - Description—This screen has a QWERTY keyboard with and a place to enter a password. There is a password hint button off to the side.

[🕒] **Locker #2 Screen - Password Hint**—The password hint says “Subtitle of my favorite game”.

[🕒] **Locker #2 Password - Wrong password**—The screen flashes and then says “Wrong Password”.

[🕒] **Locker #2 Password - FINDEROFSTARS**—The locker opens up, and inside the locker are a bunch of street clothes (that aren't relevant) and a steel panel. *(Show the solvers Panel #2)*

Locker #3 Screen - Description—This screen has a clock which has a movable minute and hour hand, along with a SUBMIT button. There is a password hint button off to the side.

[🕒] **Locker #3 Screen - Password Hint**—The password hint says “Remember it's all about how fast things accelerate”.

[🕒] **Locker #3 Password - Wrong password**—The screen flashes and then says “Wrong Password”.

[🕒] **Locker #3 Password - 2:05**—The locker opens up, and inside the locker are a bunch of street clothes (that aren't relevant) and a steel panel. *(Show the solvers Panel #3)*

Locker #4 Screen - Description—This screen has a QWERTY keyboard with and a place to enter a password. There is a password hint button off to the side.

[🕒] **Locker #4 Screen - Password Hint**—The password hint says “Where I end when the game ends”.

[🕒] **Locker #4 Password - Wrong password**—The screen flashes and then says “Wrong Password”.

[🕒] **Locker #4 Password - TELVACURY**—The locker opens up, and inside the locker are a bunch of street clothes (that aren't relevant) and a steel panel. *(Show the solvers Panel #4)*

North Door

Description—This door is locked, but there is a note on it. The note says “Note to all guards - here is your locker assignments: #1 - Etals. #2 - Aercel. #3 - Sill. #4 - Exens. Please make sure to change your passwords and hints as indicated by the management note on the other door.”

Planet Board Game

Description—This exhibit is designed to teach museum goers about the Abeonides system. On the exhibit there is a board with a marker that stands on the planet Abenoides, and a small deck of cards. A button on the side controls the movement of the pawn and flipping the cards. Looking over the rules of the game, the deck of cards contains one copy of each number 1 through 9, and when you press the button, it flips the top card over, moves you that many spaces counterclockwise, and then reads out a fact about that planet. The speaker seems to be broken however.

[🔊] Press a Button:

First time—You draw a 7, which takes you to Gniximia. The speaker feebly tries to say something, but it isn't understandable.

Second time—You draw a 5, which takes you to Xalmion. The speaker feebly tries to say something, but it isn't understandable.

Third time—You draw a 8, which takes you to Debapus. The speaker feebly tries to say something, but it isn't understandable.

Fourth time—You draw a 3, which takes you to Gotera. The speaker feebly tries to say something, but it isn't understandable.

Fifth time—You draw a 1, which takes you to Crikaliv. The speaker feebly tries to say something, but it isn't understandable.

Robotic Frog

Description—This metallic frog has breaks at the joints, implying that it can move on its own. The frog has 4 buttons on the back. One is red, one yellow, one green, one blue.

[🔊] **Inputting a combination that isn't correct**—The buttons flash, but the frog doesn't do anything.

[🔊] **Inputting a combination that is correct**—The frog jumps to the [location], then all of the buttons turn white, and it is posed waiting to jump again.

At this point, whenever the solvers hit any of the white buttons [🔊], the frog jumps to the next location. If there is another location for the frog to jump to in the list, then the buttons stay white, and the frog is ready to jump again. If the frog is at the last location, then the frog turns off and doesn't respond to any more input (at least, until the room resets).

RRGB - Tesseract - Planet Board Game - Arcade Game - Lockers

GYBR - Grandfather Clock - Planet Board Game

GGGY - Tesseract - Planet Board Game - Grandfather Clock - Arcade Game - Lockers

RGBG - Tesseract - Grandfather Clock - Planet Board Game

YYBB - Tesseract - Planet Board Game - Grandfather Clock - South Door - North Door

South Door

Description—The door is closed and unlocked, but that's because you left it that way. On the backside of the door you see a note: "Notice to all guards. We have reason to believe that Ambassador Fishkulp will attempt to reacquire the Muffcing by force. To prevent this, we have updated the security. There are four passwords on the pedestal, and each of you have part of each password. Do not reveal your part without the other three guards present. These new password parts have been delivered in your lockers. As part of this, make sure that you change your passwords, and don't forget to update your password hints!"

Tesseract Model

Description—This is a model tesseract made of various metals. The plaque at the bottom encourages you to touch two corners at a time to complete circuits, but the output seems to be in letters instead of numbers, so you're not sure what it's supposed to do.

(Show the solver the Tesseract handout.)

Walkie Talkie

Description—This is a digital walkie talkie. The contact list has three people on it: Etals, Exens, and Sill. Even though it's a digital walkie-talkie, it still makes a satisfying *skrt* sound.

[🔊] Calling Exens or Sill—You call them, but there is no response.

Calling Etals—*Etals is there, and they start a conversation with the solvers. During this conversation, they should try to figure out Etals' best friends' pet, the planet they live on, and the year they were born. There is no one defined way to get this information. As long as their method seems reasonable to you, it should be good. The first piece of information should work fine - the second piece of information before a reset should prompt Etals to suspect that they are trying to figure out their password and cut off the conversation.*

Treat a successful attempt at finding out a piece of information as an action [🔊], and treat Etals cutting off the conversation as an action [🔊].

CONCLUSION

The box clicks open, and a fifth light lights up on the device. You flinch, waiting for a flash, but it never comes. Grabbing the device, you run out of the museum, making sure that no one sees you on the way out.

You deliver your payload to your contact, and then forget about it for a while. Later, in the news, you hear that it has resurfaced. Authorities found it, and they attempted to capture the person who had it. However, the article notes that every time they close in on the person who has it, they seem to just barely escape. You laugh. You know why and you have no inclination to tell them.

GM'S EXPLANATION

The puzzles in this room divide into two halves - the puzzles to open the lockers and the puzzles inside the lockers. The puzzles to open the lockers all use the time loop in some way, and the puzzles inside the lockers each have to deal with a different dimension.

To open Locker 1, you need some information about a specific guard. The note on the north door tells you that you need information about Etals. You can use the walkie-talkie to talk to them and social-engineer it out, but as soon as you try to get a second piece of information out of them, they suspect what you're doing and refuse to talk to you, which means that you'll need to do this puzzle over three different loops.

To open Locker 2, you need the subtitle of their favorite game. This is the holo-arcade game which isn't on. You can plug it in and turn it on, but it takes a long time to boot up. In order to have enough time, booting it up is the first thing you need to do in the room, then it will finish right before the room resets.

To open Locker 3, you need how fast the grandfather clock accelerates. At each time, you can check what the grandfather clock says. If you take the differences in the time, you will get 1:10, 3:15, 5:20, 7:25, and 9:30. These differences increase by 2:05, which is how fast the clock is accelerating.

To open Locker 4, you need to figure out where the pawn ends up on the planetary board game. The problem is, you can't play it out because it would take 9 actions and you only have 5 before it resets. However, assuming the game ends when all 9 cards have been drawn, you can assume that you would travel a total of 45 spaces (the sum of the numbers from 1-9), and then count that many spaces around the board.

To get the first password, you need the words FIBONACCI and SQUARES. On the line of 23 lights, first light up only the Fibonacci numbers, then light up only the square numbers. This will give you the letters AX and IS.

To get the second password, you need the RGBY strings and the frog. Press that combination of buttons into the frog, and it will start hopping around. Continue to press the white buttons and when it stops, it will spell out a letter around the room. You may need to view that letter from a different perspective, as indicated by the arrows next to it.

To get the third password, you need the animal symbols and the animal cube. Find the distance between each pair of animals (using a three-dimensional version of the Pythagorean Theorem), and then square it to get an integer between 1 and 26. Turn these numbers into letters to get the answer.

To get the fourth password, you need the coordinates and the tesseract. Each letter in the coordinates represents a direction on the tesseract - Up/Down, Left/Right, Front/Back, In/Out. Use these coordinates to find pairs of buttons to press on the tesseract. These letters will be your answer.

The order of the passwords can be found with trial and error (and most tables I've ran have), but you can also discover the order by noticing that the first puzzle is a one-dimensional puzzle, the second one is a two-dimensional puzzle, etc.

Once all four passwords are in place, you still need to unlock the case, which takes a conical key. The passwords (plus extra word on the screen) spell out AXIS PLANE HOLDS CHRONOLOGICAL ESCAPE. The Axis & Allies game contains little plastic planes, and one of those will open the lock, and let you escape from the time loop!

HANDOUTS

If you're playing online, the links below will take you to the handouts. None of these are editable, so you can just share these links with your players.

23 Lights: <http://apocute.com/lineoflights.html>

Tesseract: <http://apocute.com/tesseract.html>

Animal Cube: <https://docs.google.com/drawings/d/1Wpo0yqh2XQtE8APbqy3EY3ULO78xMoizqgm-Wkwdvp4/edit?usp=sharing>

Planet Board Game: <https://docs.google.com/drawings/d/1FkVjkYl66aMtTclibeGqzDEfVyKvhm5ODQHAxgJznul/edit?usp=sharing>

Panel 1: <https://docs.google.com/drawings/d/1N5ytZz9UhAnt3xRUaIdgDI-9EuREqwEMLBFACto7hKQ/edit?usp=sharing>

Panel 2: <https://docs.google.com/drawings/d/1Lr1o9rfFU2FiJaeBtXrW63dQPbh9DEUHE2I5MXIolbs/edit?usp=sharing>

Panel 3: https://docs.google.com/drawings/d/1qnUGFPAKrUf_OqTbaxbJUtBBBQt_EcZ7telg1YPzzP0/edit?usp=sharing

Panel 4: https://docs.google.com/drawings/d/1TRISs67sjtJKj3Bb6wjFZnGEtQD9X23_nmlbJw0kNM/edit?usp=sharing

Note that the Line of Lights and the Tesseract handouts are interactive webpages. Depending on how you are running this scenario, an interactive webpage may not be the most appropriate method. If you want to describe them to your players, here are the important things you will need to know to imitate them:

23 Lights:

Turning on lights 1, 2, 3, 5, 8, 13, 21—AX

Turning on lights 1, 4, 9, 16—IS

Turning on any other lights—Irrelevant letters

Tesseract:

Pressing on corners D & K—C

Pressing on corners C & P—H

Pressing on corners I & J—R

Pressing on corners H & M—O

Pressing on corners G & I—N

Pressing on corners B & M—O

Pressing on corners A & J—L

Pressing on corners I & P—O

Pressing on corners E & H—G

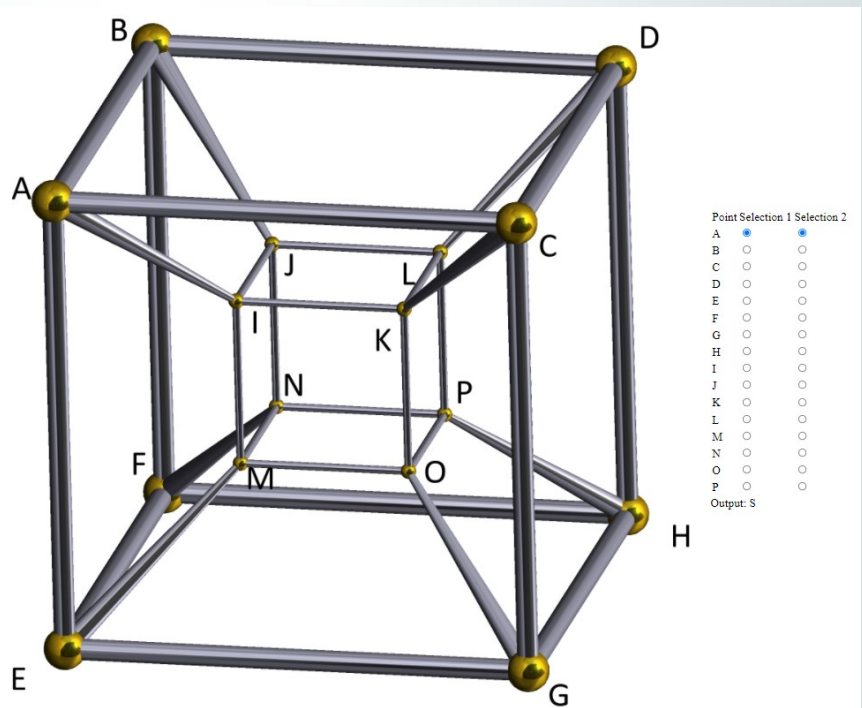
Pressing on corners D & F—I

Pressing on corners G & M—C

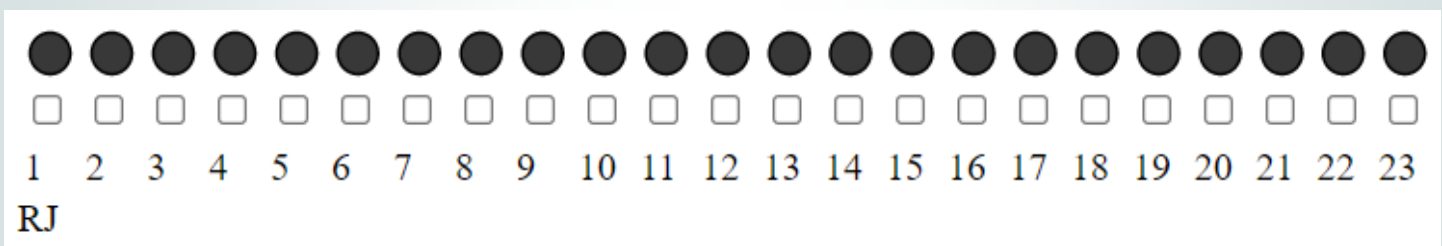
Pressing on corners C & E—A

Pressing on corners D & M—L

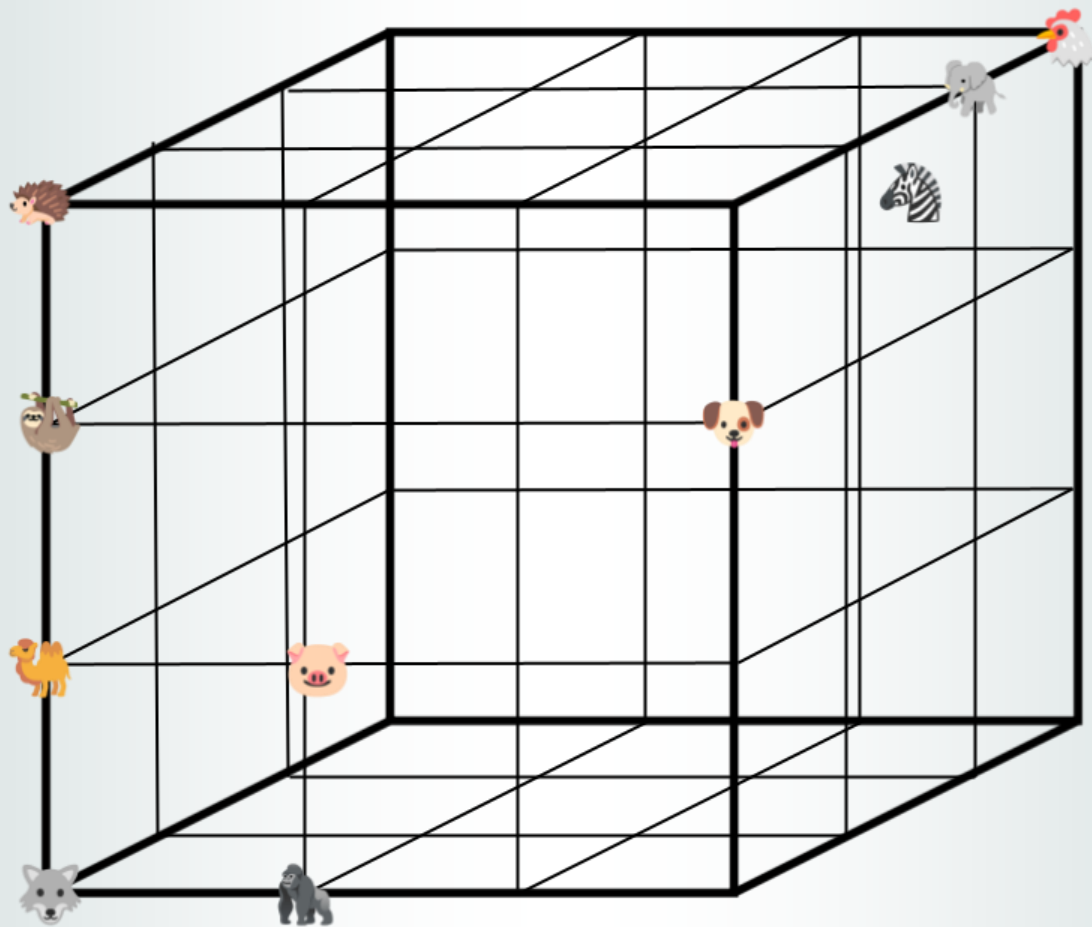
Pressing on any other corners—Irrelevant letters



Above: Tesseract Handout, Below: 23 Lights Handout



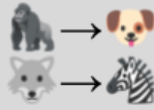
Animal Cube



Planetary Board Game



Panel 1



(URBO, URFI)
(URFO, DRBI)
(ULFI, ULBI)

RRGB↑

Panel 2

FIBONACCI

(DRBO, DLFI)
(DRFO, ULFI)
(ULBO, DLFI)

GYBR←
GGGY↑



Panel 3

(ULFO, ULBI)
(ULFI, DRBI)
(DLFO, DRBO)
(URBO, DLBO)



RGBG↑

On back - “🌀 = $(\sqrt{5}, \sqrt{5}, \sqrt{5})$ ”

Panel 4

SQUARES

(DRFO, DLFI)
(URFO, DLFO)
(URBO, DLFI)

YYBB→

