Zoo Exhibit Signs and Quantity of Readers Based on Location

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Introduction

Exhibit design is a very important factor of any educational institution. This researcher's opinion is that the best way to give information out or educate the visitors is by using signage. In this economy, a lot of institutions do not have the funds to pay staff to be in every exhibit. In order for a sign to do its job properly people must read it. There are a lot of things that must be considered when making a sign including the colors, the font, and the target audience. Another important aspect of a sign is where it is positioned. In one study by Borowsky, Shinar and Parmet, researchers looked at signs for drivers and where they were positioned and if it affected the reading and understanding of the sign. They found that if a sign is placed in an unexpected location, people were less likely to follow it and took more time to understand it (Borowsky, 2008). Another study done by Hall, Ham and Lackey looked at sign types that were monitored within Yosemite National Park and noted which signs were more effective in telling visitors to lock up their food due to bears (2010). In the discussion they mention that regardless of how vivid the signage is it may be ignored when placed in a certain area than if it were placed in another. Clearly the placement of signs is an important factor not only with driving signs which must be understood in mere seconds but with educational signs as well. This study focuses on placement of signs within a zoo exhibit in different settings. These settings include indoor, outdoor and outdoor but covered signs.

At Cleveland Metroparks Zoo (CMZ) education is a main aspect of the Zoo environment. In order to give out information there are several ways including volunteers, interpretive staff

and the animals themselves; however signage is the largest part of the equation. In one study on zoo visitor behavior, it was discussed that zoo design has a significant effect on visitor viewing time and that "visitors may feel more rushed at zoo, that because of their layout or design, tend to require longer visits…As a result, visitors spend less time, on average, at each single exhibit"(Johnston, 1998). CMZ is composed of 7 thematic areas on 165 acres of land with more than 3,000 animals representing over 600 species (Mullen, 2011). With that many animals and exhibits it would seem that people feel rushed and would not otherwise read signs unless they are repeat visitors such as zoo members. The key when designing zoo exhibits is to make people feel welcomed and want to spend longer times at each exhibit offering places to sit and rest while still seeing animals and, hopefully, reading signs.

This researcher chose to look at the sign location due to Maslow's hierarchy of needs. According to Brochu and Merriman (2008), Maslow's hierarchy groups visitors' needs into two categories. The first category that must be met is survival needs. These include food, water, shelter and safety. In order for people to reach the top which is self-actualization, these needs must be met first. The second category includes acceptance, self esteem and ultimately the self-actualization. When all the needs are met and people meet this top goal, that is when they understand and learn the most. (Pg. 42) Based on this hierarchy, sign position is important if more signs will be read indoors where more survival needs are met rather than outdoors and covered which are both subject to the elements.

This study focuses on the African Elephant Crossing at CMZ. All three locations of signs are represented at this exhibit. The question this researcher would like to address is that if a sign with an important message is put in a certain spot, is a larger audience going to come into contact with that message than if it were put in a different location?

Goals

      The goal of this study is to improve existing and future exhibit design and create a base of scientific research that supports certain designs. The ultimate goal is to help institutions get their mission and messages across to larger audiences.

Prediction

      The prediction is that more people will read a sign that is indoors rather than one that is outdoors or covered. Inside the exhibit building there are signs, both movable and stationary along with a water fountain, air conditioning and an open floor plan for the visible safety of children. These attributes speak to the survival needs of Maslow's theory of water, safety, and shelter. Since these are met indoors, more people will stop to read and interact with the signage.

Methods

      The main method of collecting data was observation. The researcher numbered each sign around and inside the exhibit and someone else chose numbers of the signs that would be observed on any given day. The observations took place on weekdays (Tuesdays, Wednesdays, Thursdays and Fridays) over a period of three (3) weeks. Monday was excluded due to the zoo being free to people of Cuyahoga County and observation would have been difficult due to the very large crowd size.

      Six (6) observations of each type of sign, indoor, outdoor, and covered were collected, the time of day and weather conditions were noted as well as what type of sign it was. A "drive by" sign consisted of two short sentences with two very large pictures that people could glance at while walking by. Animal ID signs give basic animal information near the animal locations. Another type of sign is a conservation sign that has several sentences explaining the conflict

between animals and people in Africa. The last type is an interactive sign which encourage people to feel, touch or move an object.

Whenever someone stopped at a sign for at least 5 seconds or glanced at the sign ("drive by") is considered an "instance". Other information such as the group composition (number of adults and children), races of the group, time spent at the sign and how many in the group ultimately stopped or glanced at the same sign was gathered for future studies.

Results
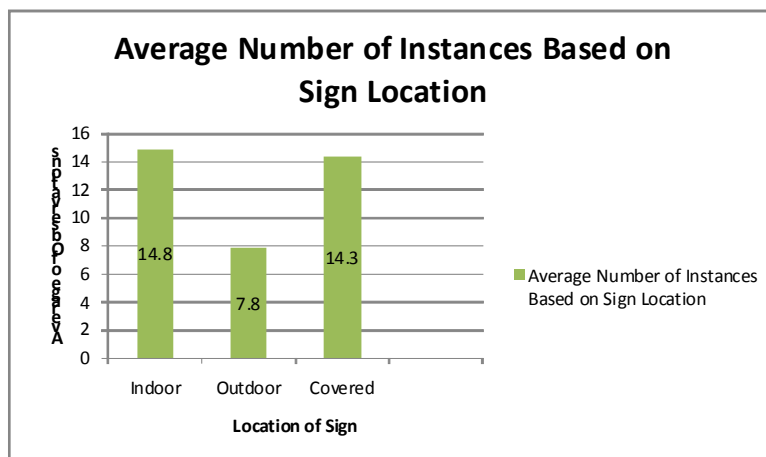
Fig 1. An "Instance" is when one (1) person stopped to read the sign. See Appendix for observation numbers.

As you can see in Fig. 1 the number of instances where one person stopped to read the sign was 1.8 times higher for the indoor and covered signs than for the outdoor signs. In Fig. 2 more people overall stopped to read indoor signs 2.3 times more than outdoor signs and 1.24 times more than covered signs. The covered signs were read 1.9 times more than outdoors signs.

Average Number of People Who Read Each Sign
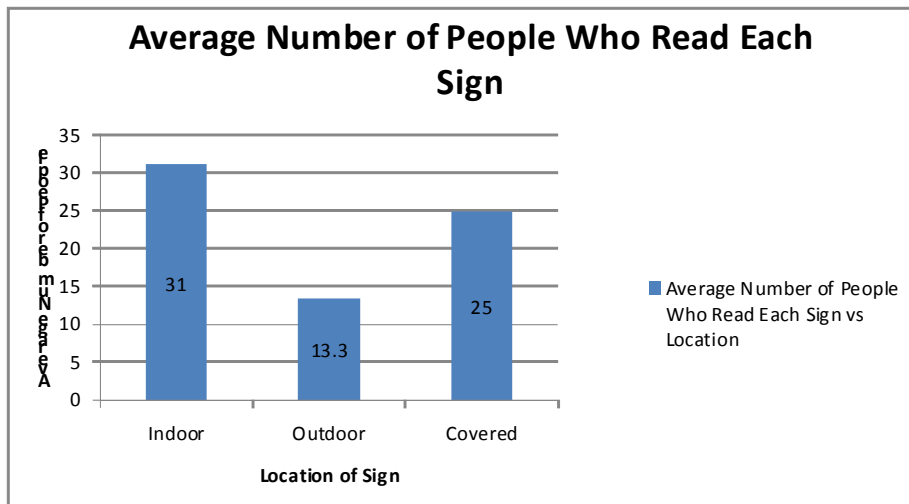
Fig 2. See Appendix for observation numbers.

Discussion

Based on the results, the prediction was confirmed that more people read the signs indoors than outdoors. Covered signs were read with almost an equal instance as indoors but fell short with the amount of people that read them. Some factors that caused some issues were times the crossing of the elephants happened during the research period which drew people away from the sign being read. Along with the crossing, the position and sightlines of certain signs might have been read more if there was an animal in that sightline. Sign location, as studied by Nassar and Al-Kaisy (2007), is important in regards to sightlines as well traffic flow through the building, in this case exhibit, means more people will stop to read it. Their mathematical model also included how long it would take for someone to read the sign.

Next Steps

The main question that wanted to be answered is that if a sign with an important message is put in a certain spot, is a larger audience going to come into contact with that message than if it were put in a different location? According to these results the answer is yes, and the prediction that more people will look at it indoors was supported. However, this study is merely a preliminary study and sparks many opportunities for further research studies. Several factors that could be examined in the information contained in the attached Appendix can be analyzed in many different ways such as type and content of signs to see if more people read a certain type of sign, colors of the sign, time of day samples were taken, and if there was an animal in the sightline of the sign.

Things that this study did not look at that would benefit this area of study would be to look at different exhibits around the zoo, compare different zoos, compare weekday crowds versus during the weekend, and different weather samples including rain, cold and snow. Several surveys could also be conducted on those who did stop to see if it the information on the sign impacted them at all or if the overall message of the exhibit was achieved.

One last thing would be to take a look at the movement of people through the exhibit One note specific to this exhibit was that people did not walk through the center of the Kgotla (circular meeting place in the middle of the exhibit) and what would be interesting are the reasons people did not walk through it.

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Appendix

DAY 2011	Indoor # (I)	Outdoor#(O)	Covered#(C)	Weather
6/28 Tuesday	1	1	1	Low 80s partly cloudy
6/29 Wednesday	1		2	69 Partly Cloudy
6/30 Thursday	1		1	80s and Sunny
7/1 Friday		1		80s Very Sunny
7/12 Tuesday		3		80s partly cloudy
7/14 Thursday	3	1	2	70s Partly Cloudy

Numbers are the number of each type of sign read that day.
C=Covered Sign   I=Indoor Sign   O=Outdoor Sign
Group Composition: (#Adults #Children) African American, Asian, Hispanic, Caucasian, Other

DATE:6/28   WEATHER: Sunny Low 80s   HOUR: 1:52pm-2:12pm   SIGN: C13-Animal ID

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read
1	(2A) 2 A	1	Bottom (Black Crake) of a group of signs. @ least 5 sec at the group of signs and the members of the group that glanced at this exact sign. (didn't count them if they didn't look at this particular sign)
2	(2A 2C) 4C	3	
3	(2A 3C) 5C	1	
4	(1A 2C) 3C	3	
5	(2A) 2C	1	
6	(2A 1C)3C	1	
7	(1A 2C) 3C	2	
8	(2A) 2C	1	
9	(2C 2A) 4C	3	
10	(1A) 1C	1	
11	(2A 2C) 4C	1	
12	(4A) 4C	3	
13	(1A 1C) 2C	1	
14	(2A 2C) 4C	2	

DATE:6/28   WEATHER: Sunny Low 80s   HOUR: 1:10pm-1:30   SIGN:
I15-Interactive Note: Large wall of interactive squares. No elephants inside.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(2A) 2C	2	31
2	(1 A 5C) 5C	3	20
3	(2A) 2C	2	60
4	(3A 4C) 7C	3	70
5	(1A 2C) 3C	3	15
6	(2A) 2C	2	10
7	(1A) 1C	1	25
8	(1A 2C) 3C	2	68
9	(4A) 3C	3	45
10	(1A) 1C	1	20
11	(1A 2C) 3C	2	15
12	(1A 2C) 3C	3	10
13	(1A 1C) 2O	2	30
14	(2A) 2C	2	50
15	(1A 6C) 7C	7	76
16	(2A) 2C	2	25
17	(2A 1C) 3C	2	54
18	(1A 1C)2C	2	19
19	(2A 1C) 3C	1	10
20	(2A) 2C	1	15
21	(4A) 4O	3	20
22	(1A 6C) 7C	6	62
23	(2A 1C) 3C	3	23
24	(1A 2C) 3C	3	92

DATE: 6/28   WEATHER: Sunny Low 80s   HOUR: 1:30pm- 1:50pm   SIGN: O23-
Drive By

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read
1	(4A 6C) 10C	7	"Drive By" sign. Short sentence, large font, 2 large pictures. Could not measure time spent, if glanced at it was counted.
2	(2A 2C) 4C	1	
3	(1A) 1C	1	
4	(1A) 1C	1	
5	(1A) 1C	1	
6	(3A 2C) 5C	1	
7	(2A 2C) 4C	2	
8	(3A 2C) 5C	1	
9	(4A) 4C	1	
10	(2A 1C) 3C	1	
11	(1A) 1C	1	
12	(2A 6C) 8C	1	
13	(1A 3C) 4C	3	
14	(1A 2C) 3C	1	
15	(2A 2C) 4C	2	
16	(1A 2C) 3C	2	
17	(1A) 1C	1	
18	(1A 5C) 6C	1	
19	(2A) 2C	2	
20	(1A 1C) 2C	2	
21	(3A 4C) 7C	6	

DATE:6/29   WEATHER: 69°F Partly Cloudy   HOUR:10:58am-11:18am   SIGN:I7-
Animal ID   Note: Elephants inside.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read
1	(2A 4C)6C	1	Counted if looked at the sign within 3 feet. Elephant Name, picture, male/female, date of birth. Could not time length of stay.
2	(1A 2C)3C	2	
3	(1A)1C	1	
4	(1A 1C)2C	1	
5	(2A 2C)4C	1	
6	(1A)1C	1	
7	(1A 3C)4C	1	
8	(1A)1C	1	
9	(2A)2C	2	
10	(3A 20C)23C	2	
11	(2A)2C	1	
12	(3A)3C	3	
13	(1A 2C)3C	1	
14	(2A)2C	1	
15	(2A 1C)3C	3	
16	(2A 1C)3C	2	
17	(2A)2C	1	
18	(2A 1C)3C	3	

DATE:6/29   WEATHER: 69°F Partly Cloudy   HOUR: 11:21AM-11:41AM
SIGN:C14-Animal ID

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read
1	(3A1C)4C	2	Middle (Lady Ross Turaco) of a group of signs. @ least 5 sec at the group of signs and the members of the group that glanced at this exact sign. (didn't count them if they didn't look at this particular sign)
2	(3A2C)5AA	2	
3	(2A)2C	2	
4	(2A)2C	2	
5	(2A3C)5C	2	
6	(2A3C)5C	5	
7	(2A2C)4C	2	
8	(1A2C)3C	3	
9	(2A2C)4C	2	
10	(2A1C)3C	1	
11	(1A1C)2C	1	
12	(1A1C)2C	2	
13	(1A)1C	1	
14	(2A1C)3C	1	
15	(4A)4C	3	
16	(1AC)1A	1	
17	(2A)2C	2	
18	(2A)2C	2	
19	(3A)3C	2	
20	(1A3C)4C	1	
21	(2A1C)3C	3	
22	(2A)2C	2	
23	(2A2C)4C	1	

DATE:6/29   WEATHER: 69°F Partly Cloudy   HOUR: 11:50AM-12:10PM
SIGN:C19-Animal ID
Note: Too crowded around this sign to time length of reading. People behind the first row cannot read the sign.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read
1	(2A1C)3C	1	Elephant ID: Counted people who read for at least 5 seconds.
2	(2A1C)3C	1	
3	(2A2C)4C	2	
4	(2A4C)6C	1	
5	(4A1C)5C	2	

DATE:6/30   WEATHER: 80s Very sunny HOUR: 1:07pm-1:27pm   SIGN: C22-Interactive

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read
1	(2A3C)5C	1	Counted if people glanced/touched/read sign. Rubbing sign. If it was unclear of looking at the sign was not counted.
2	(2A1C)3C	1	
3	(1A4C)5C	1	
4	(1A2C)3C	1	
5	(2A2C)4C	1	
6	(1A2C)3C	1	
7	(2A1C)3C	1	
8	(2A)2C	1	
9	(3A)3C	2	
10	(1A3C)4C	3	
11	(2A1C)3C	2	
12	(2A3C)5C	1	
13	(2A6C)8C	2	
14	(1A3C)4C	1	
15	(3A1C)4C	2	
16	(1A3C)4C	2	
17	(2A1C)3C	1	
18	(1A4C)5C	2	

DATE:6/30   WEATHER: 80S Very Sunny   HOUR: 12:43pm- 1:03pm   SIGN: I13-Interactive

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(1A4C)5C	3	14
2	(2A4C)6C	3	35
3	(2A)2C	2	26
4	(5A)5C	3	23
5	(2A2C)4C	1	5
6	(2A3C)5C	4	10
7	(1A1C)2C	2	12
8	(2A)2C	1	5
9	(1A1C)2C	2	30
10	(1A1C)2C	1	12
11	(2A)2C	2	10
12	(1A1C)2 AA	2	26
13	(1A1C)2C	1	5
14	(1A1C)2C	2	14
15	(1A2C)3C	2	11
16	(2A1C)3C	2	10
17	(2A2C)4C	1	5

DATE:7/1   WEATHER:80s Very Sunny HOUR: 12:19pm-12:39pm   SIGN: O4-Conservation

Note: People walked to the left of the deck away from the sign. Also there is a water fountain to the right that people spent more time at (visually timed) and could not see the sign from there.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(3A)3C	1	8
2	(2A1C)3C	1	13
3	(1A1C)2C	1	17
4	(2A)2C	1	7
5	(3A)3C	2	23
6	(2A1C)3C	1	6
7	(2A4C)6C	2	27
8	(1A3C)4C	2	7
9	(2A2C)4C	1	15
10	(3A3C)6C	2	12
11	(2A1C)3C	2	11
12	(2A2C)4C	2	36
13	(2A)2C	1	15

DATE:7/12   WEATHER:80s Mostly Cloudy   HOUR: 10:30am-10:50am   SIGN: O9-Conservation

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(3A2C) 5H	2	5
2	(2A3C)5C	3	20
3	(2A)2C	2	23
4	(1A)1C	1	30
5	(2A3C5)C	2	18
6	(2A)2C	1	25
7	(3A5C8)C	2	8
8	(3A2C)5C	1	28
9	(2A3C)5C	3	13

DATE:7/12   WEATHER: 80s Mostly Cloudy   HOUR: 11:00am-11:20am   SIGN: O8-Conservation

*Note: No elephants on that side. Crossing just happened.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(2A)2C	1	5

DATE:7/12   WEATHER:80s Mostly Cloudy   HOUR: 12:35pm-12:15pm
SIGN: O38-Conservation

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(1A) 1C	1	11
2	(1A 4C) 5C	1	9

DATE:7/14 WEATHER: 70s Partly Cloudy HOUR:10:01am-10:21am SIGN: O35Interactive/Conservation
Note: Conservation sign with wheel. The two kids that read it just spun the sign. Not a lot of people walked through middle area. Animal get close with volunteer in sight of sign that drew many people.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(4A 30C) 1H 1O 32C	2	6

DATE:7/14   WEATHER:70s Partly Cloudy   HOUR: 10:23am-10:43am   SIGN: C9-Animal ID

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(2A) 2C	1	#2 from Top (Kenya Crested Guineafowl) of a group of signs. @ least 5 sec. at the group of signs and the members of the group that glanced at this exact sign. (Didn't count them if they didn't look at this particular sign)
2	(2A)2C	1	
3	(2A1C) 1H 2C	2	
4	(1A1C)1O 1C	2	
5	(1A1C)2C	1	
6	(2A3C)5C	2	
7	(2A3C)5C	3	
8	(2A1C)3C	1	
9	(2A2C)4C	1	
10	(2A)2C	1	
11	(2A)2C	2	

DATE:7/14   WEATHER:70s Partly Cloudy   HOUR: 10:45am-11:16am   SIGN: C12-Animal ID

Note: Elephant crossing occurred at 10:53am and had to suspend observation. Restarted and completed the 20 minutes.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(5A2C)7C	3	#2 from bottom (Speckled Pigeon) of a group of signs. @ least 5 sec. at the group of signs and the members of the group that glanced at this exact sign. (Didn't count them if they didn't look at this particular sign)
2	(3A3C)2O4C	2	
3	(2A)2C	2	
4	(2A)2C	2	
5	(2A)2C	2	
Paused for Elephant Crossing			
6	(2A2C)4C	3	
7	(2A)2C	2	
8	(1A1C)2AA	1	
9	(1A10C)6AA 5C	3	
10	(3A1C)4C	2	
11	(1A1C)2C	2	
12	(2A2C)4C	1	
13	(2A2C)4C	3	
14	(2A)2C	1	
15	(2A3C)5C	2	

DATE:7/14   WEATHER:70s Partly Cloudy   HOUR:11:25am-11:45am SIGN: I6-Animal ID

Note: No elephants inside the building. This sign was partly being covered by a plant but you could still see there was a sign. As people were walking in they looked right in the same direction as the sign but then walked left.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(1A5C)6C	1	Counted if looked at the sign within 3 feet. Elephant Name, picture, male/female, date of birth. Could not time length of stay.
2	(2A)2C	1	
3	(3A3C)6C	2	
4	(2A1C)3C	1	
5	(2A3C)5	1	

DATE: 7/14   WEATHER: 70s Partly Cloudy   HOUR: 11:45am-12:05pm   SIGN: I1-Interpretive

Note: No elephants inside. As people were walking in they looked right in the same direction as the sign but then walked left.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(2A3C)5C	5	If glanced in that direction of the sign. Along the right wall people looked and then walked left. If walked over to the sign, invested a minimum of 10 seconds looking at it.
2	(2A2C)4C	1	
3	(2A)2C	1	
4	(2A)2C	2	
5	(3A)3C	2	
6	(2A1C)3C	1	
7	(2A1C)3C	1	
8	(1A2C)3C	3	
9	(2A)2C	1	
10	(2A)2C	2	
11	(1A2C)3C	4	
12	(3A1C)4C	4	
13	(1A2C)1AA 2C	2	
14	(4A5C)1AA8C	2	
15	(2A2C)4C	4	
16	(1A4C)4AA 1O	5	

DATE: 7/14   WEATHER: 70s Partly Cloudy   HOUR: 12:06pm-12:26pm   SIGN: I18-Conservation

Note: No elephants inside. Right next to water fountain. To the left an interactive weight scale on the floor.

Instance of 1 person reading	Group composition (#A, #C)AA, A, H, C, O	How many stopped to read	How Long Read (sec): Timed only 1 person in the group
1	(1A)1C	1	5
2	(1A1C)2C	1	5
3	(3A2C)5C	1	9
4	(2A2C)4C	1	18
5	(3A2C)5C	1	5
6	(2A2C)4C	2	5
7	(1A3C)4C	4	11
8	(2A)2C	2	10
9	(3A6C)9C	4	24