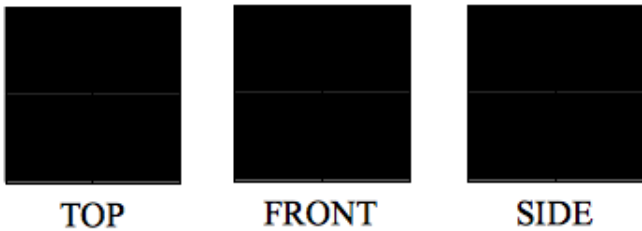


Projections and the Multiple Solids Represented Early Elementary

Meeting 2, 10/7/12

1. Build all possible 3d shapes over a a square of size 2×2 that have the following projections:

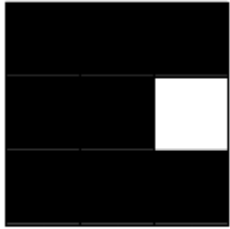


Fill in the table below with the number of cubes you used to build each solid. Show your work to the instructor at your table to be sure that you found all the solids with the given projections.

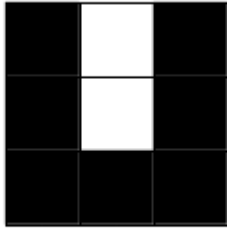
Solid	# of cubes used
1	
2	
3	
4	
5	
6	
7	
8	

How many different solids with these projections did you build?

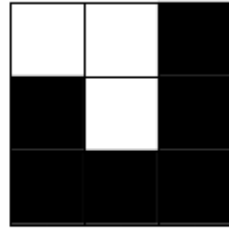
1. Make a 3d solid that has the following projections.



TOP



FRONT



SIDE

(a) Find all possible solids that have these projections.

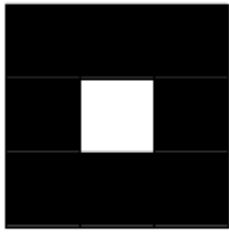
(b) For each of these solids, count the number of cubes used and record in the table

Solid	# of cubes used
1	
2	
3	
4	
5	

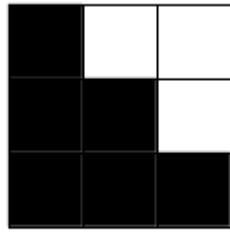
(c) How many different solids have these three projections?

(d) Emanuelle built a shape which has these three projections. She used 14 cubes for her shape. Can you determine which shape she built?

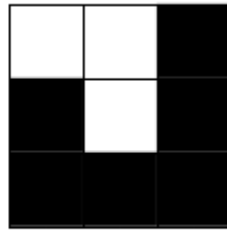
2. Make a 3d solid that has the following projections.



TOP



FRONT



SIDE

(a) Find all possible solids that have these projections.

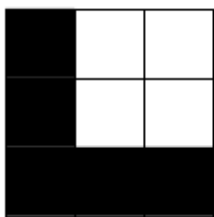
(b) For each of these solids, count the number of cubes used and record in the table

Solid	# of cubes used
1	
2	
3	
4	
5	

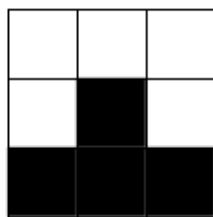
(c) How many different solids have these three projections?

(d) Give that there are 13 cubes used, do you know what the solid is?

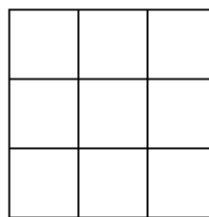
3. Given the top and the front projections, can you figure out what the third (the *left* side) projection is? Try to do it without building the solid if you can. If not, build the solid first.



TOP



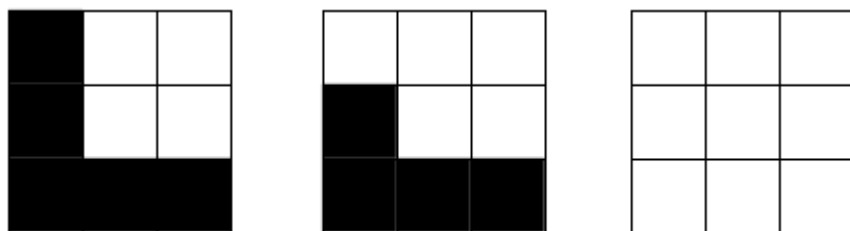
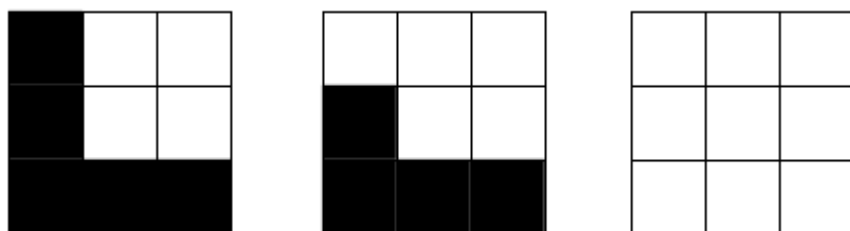
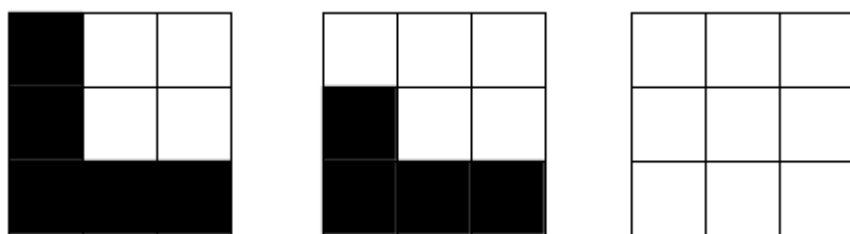
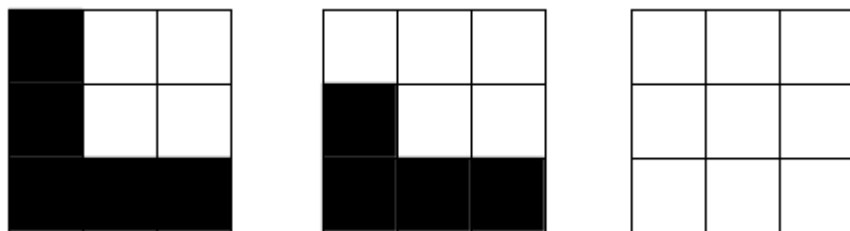
FRONT



SIDE

4. Given the top and the front projections, can you figure out what the third (the side) projection is?

-Try to do it without building the solid if you can. (Hint: There is more than 1 way)



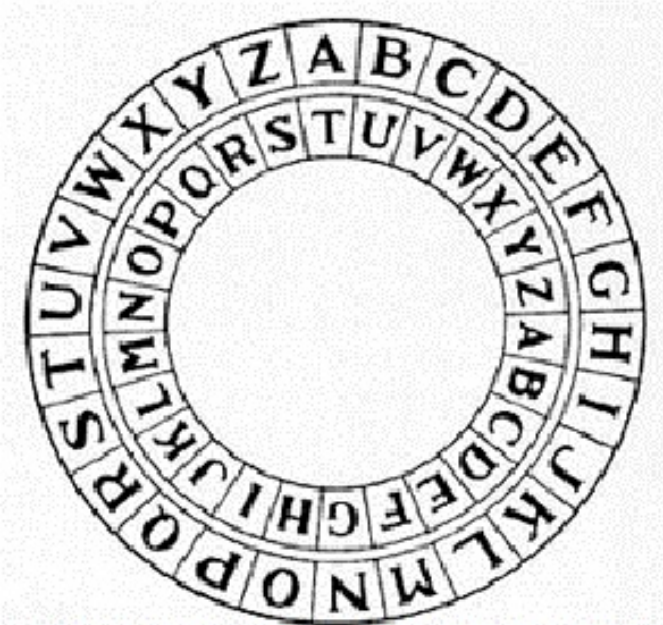
TOP

FRONT

SIDE

Ciphers Continued!

5. The simplest of monoalphabetic ciphers is the *Caesar (or shift) cipher*. In this cipher, the key is just a “shifted” alphabet.



<http://www.prs.org/images/linart/mmodwhee.jpg>

6. This is an example of a Caesar cipher:

Letter:	A	B	C	D	E	F	G	H	I
Encoded Letter:	E	F	G	H	I	J	K	L	M

Letter:	J	K	L	M	N	O	P	Q	R
Encoded Letter:	N	O	P	Q	R	S	T	U	V

Letter:	S	T	U	V	W	X	Y	Z	-
Encoded Letter:	W	X	Y	Z	A	B	C	D	-

Notice that the end of the alphabet “wraps around” to the beginning, so when we reach the end of the alphabet, we begin again.

The shift of this cipher is “+4.” Each letter in the original text is replaced by the letter which comes 4 letters after it.

(a) Use the key above to encode your name:

(b) Fill in the key for a Caesar cipher with a shift of +7:

Letter:	A	B	C	D	E	F	G	H	I
Encoded Letter:									

Letter:	J	K	L	M	N	O	P	Q	R
Encoded Letter:									

Letter:	S	T	U	V	W	X	Y	Z	-
Encoded Letter:									-

Use your key to decode the following message:

F U B C L N V A P A