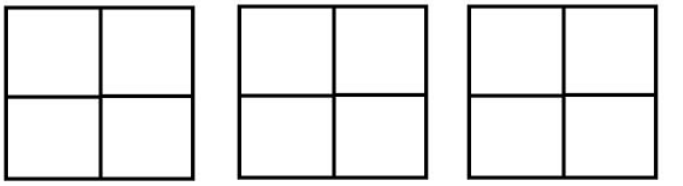
3D Solids and Their Projections

February 27, 2014

Use the blocks you have brought for this question.

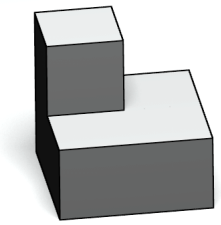
1. Build a 3D structure over a 2×2 square base so that it fits into a cube of size $2 \times 2 \times 2$. (This means that you will use no more than 8 blocks. You do not have to use all your blocks!)

Shade the grids below to indicate the top, front and **LEFT** side projections of the 3d shape you have built:

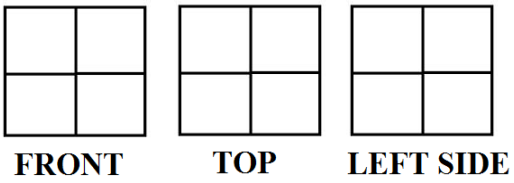


2. Share the top, front, and side projections of your solid with a partner. Are your projections the same? Are your solids the same?

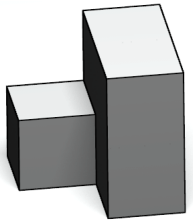
3. Travis built the following solid:



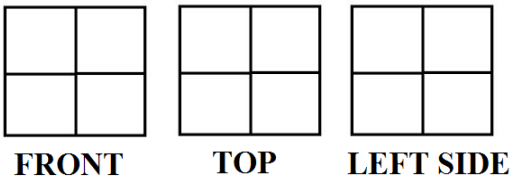
a. Draw the front, top, and left projections of Travis' solid:



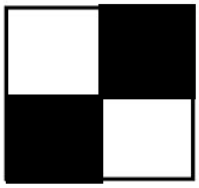
4. Katherine built the following solid:



a. Draw the front, top, and left projections of the solid.

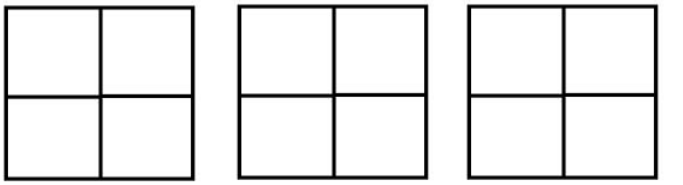


5. Katja drew this projection:



Is it the top, front or side projection? How do you know?

6. Build two different solids that have the same projections. Fill in what those projections look like:



7. Make a 3D solid that has the following projections.

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:

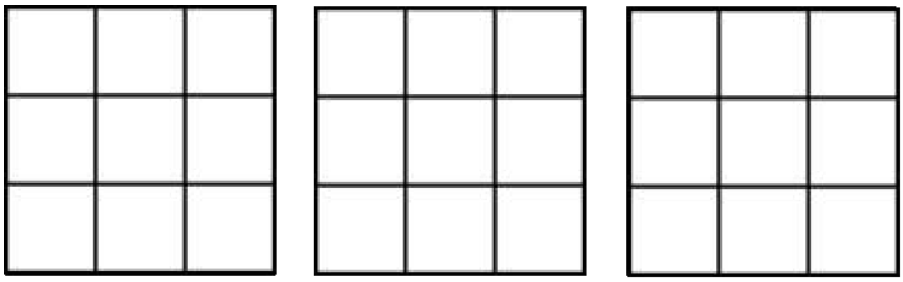
Solid	# of cubes used
1	
2	
3	
4	
5	
6	

c. How many different solids have these three projections?

Use the blocks you have brought for this question:

8. Build a 3D solid over a square of size 3×3 base so that it fits into a $3 \times 3 \times 3$ cube. (This means you will use no more than 27 blocks).

Shade the grids below to indicate the top, front, and left side projections of the 3d solid you have built.

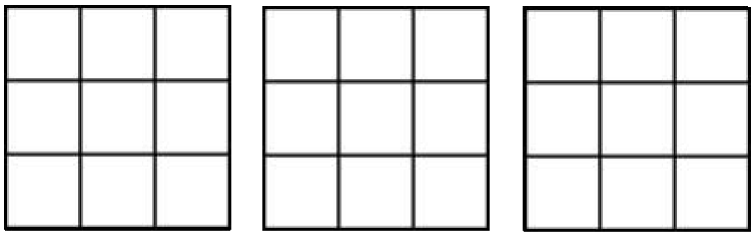


FRONT **TOP** **LEFT SIDE**

a. Share the top, front, and side projections of your solid with a partner. Are your projections the same? Are your solids the same?

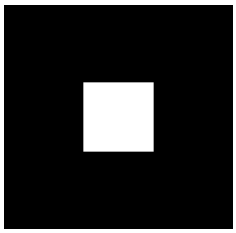
9. Do you think it is possible to have 2 *different* solids over the base of size 3×3 that have the same projections?

If yes, build such a pair of solids and shade in their projections below.



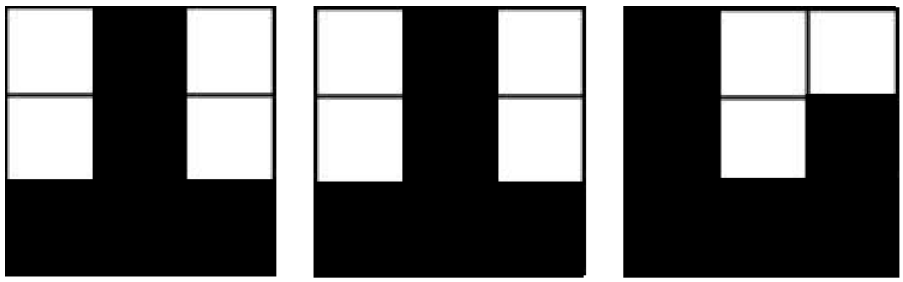
If no, explain why not.

10. Katja drew this projection:



a. Is it the top, front or side projection? How do you know?

11. Make a 3D solid that has the following projections:



FRONT **TOP** **LEFT SIDE**

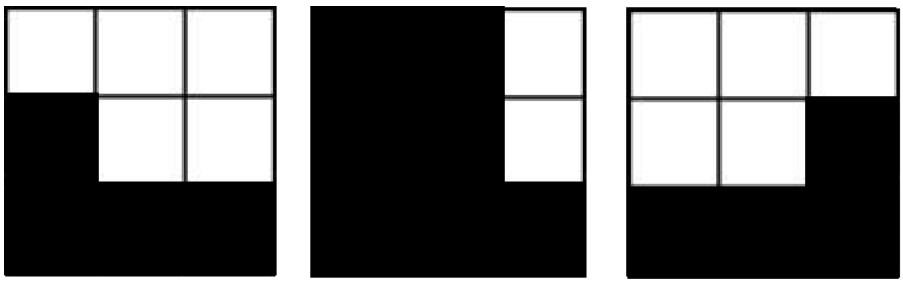
a. Find all possible solids that have these projections.

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?

12.Make a 3D solid that has the following projections.



FRONT **TOP** **LEFT SIDE**

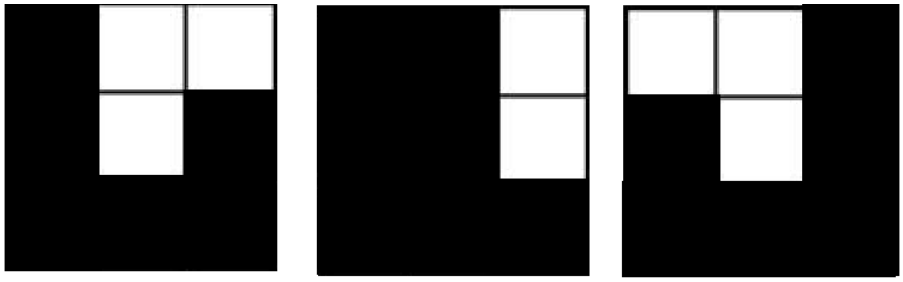
a. Find all possible solids that have these projections.

b. For each of these solids, count the number of cubes used and record in the table below:

Solid	# of cubes used
1	
2	
3	
4	
5	

c. How many different solids have these three projections?

13. Make a 3D solid that has the following projections.



FRONT **TOP** **LEFT 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?