

TEACHER GUIDE

GeoGenius

VISUALISATION KIT

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GeoGenius Visualisation Kit

TEACHER GUIDE

Visualisation processes are very important in the development of geometrical understanding. Given the limitations of print, we most often experience three dimensional objects (3D) through two dimensional (2D) representations, both in school mathematics and in general. This kit has been created to assist children in developing their visualisation skills by gaining experience in looking at objects from different perspectives (views) so that over time they will be more confident in interpreting 2D representations of 3D objects.

In the visualisation activities of this kit, four players work together to construct a 3D arrangement of blocks where each player only has information about one view of the arrangement. This is in essence a co-operative activity, but a competitive edge can easily be added by setting up the activity as a timed task, or having two or more groups of children compete to see who can complete the activity first. As the level of complexity increases, so does the co-operation needed within groups.

The notes in this guide support and extend the discussions generated by particular card sets and views. Each set, in each level has been developed to follow a deliberate conceptual progression.

PROGRESSION OF CARD SETS FOR BEGINNER LEVEL

- 4 views that are the same (orientation on grid may differ).
- Opposite views that are the same (orientation on grid may differ).
- Draw attention to orientation on the grid.
- Draw attention to different properties of 3D objects which will affect 2D view.
- The triangular block (prism) introduces ambiguity.

PROGRESSION OF CARD SETS FOR NOVICE LEVEL

- 4 views that are the same with 2 and 3 blocks (orientation on grid may differ).
- Opposite views that are the same with 2 and 3 blocks (orientation on grid may differ).
- Introduce triangular block (prism) to 2 and 3 block view.
- Hidden views with 2 and 3 blocks (as well as discuss different views, for example, what is the same and what is different).
- Stacked and hidden views with 2 and 3 blocks (as well as discuss different views, for example, what is the same and what is different).
- Draw attention to orientation on the grid.
- Draw attention to different properties of 3D objects which will affect 2D view.
- The triangular block (prism) continues to introduce ambiguity.

PROGRESSION OF CARD SETS FOR COMPETENT LEVEL

- 4 block view (with hiding and stacking).
- 5 block view (with hiding and stacking).
- 6 block view (with hiding and stacking).
- 7 block view (with hiding and stacking).
- Discuss views as number of blocks increases, what is different and what is the same.
- Draw attention to orientation on the grid.
- Draw attention to different properties of 3D objects that will affect 2D view.
- The triangular block (prism) continues to introduce ambiguity, especially as it is also now seen on its side.

PROGRESSION OF CARD SETS FOR EXPERT LEVEL

- 2 block view (4 views the same).
- 3 block view (with hiding and stacking).
- 4 block view (add triangular block (prism) 1 and no stacking/hiding).
- 5 block view (use arrangement that could deliberately confuse block selection due to absence of colour).
- 6 block view (add triangular block (prism) 1 and 2 with stacking and hiding).
- 7 block view.
- Absence of colour as an added challenge due to the illusion greyscale creates.

PROGRESSION OF CARD SETS FOR PROFESSIONAL LEVEL

- 2 block view (opposite views the same).
- 3 block view (with hidden and stacking).
- 4 block view (add triangular block (prism) 1 and no stacking/hidden).
- 5 block view (use arrangement that could deliberately confuse block selection due to absence of colour).
- 6 block view (add triangular block (prism) 1 and 2 with stacking and hidden).
- 7 block view.
- Absence of colour as an added challenge due to illusion silhouette creates.

NOTE

For the purpose of discussion please note the following on "same" and "different" as used throughout the levels.

"The same" means that the viewer sees a 2 x 2 square from each view in diagram 1. "Same" is not referring to the position, because while one person sees the blocks on the left, the other sees it on the right.

"Different" means that the viewer sees a different dimension of the same block. In diagram 2, view A and C see the red block as 2 x 1; but view B and D see it as 3 x 1. "Different" is not referring to the position, because while one person sees the blocks on the left, the other sees one block further right.

DIAGRAM 1

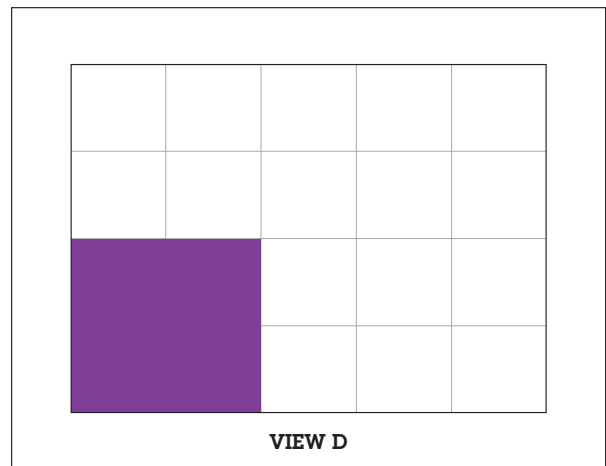
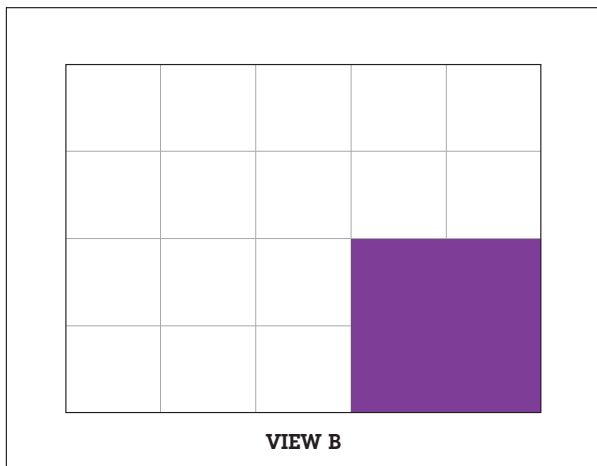
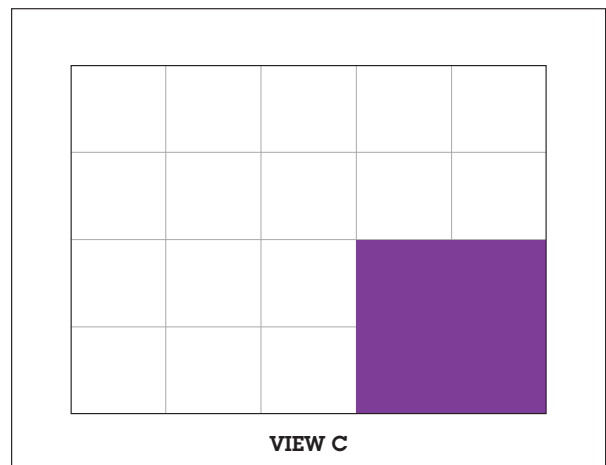
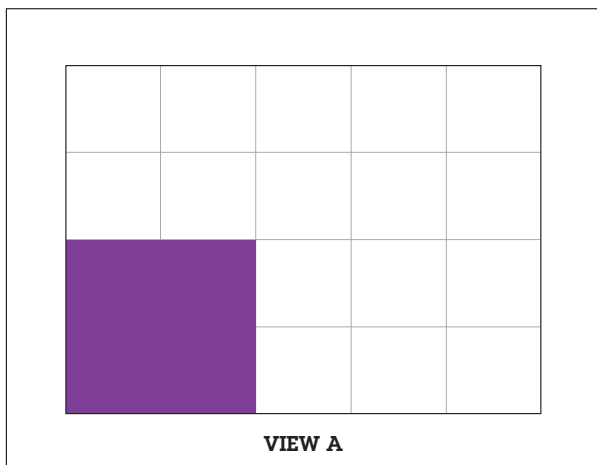
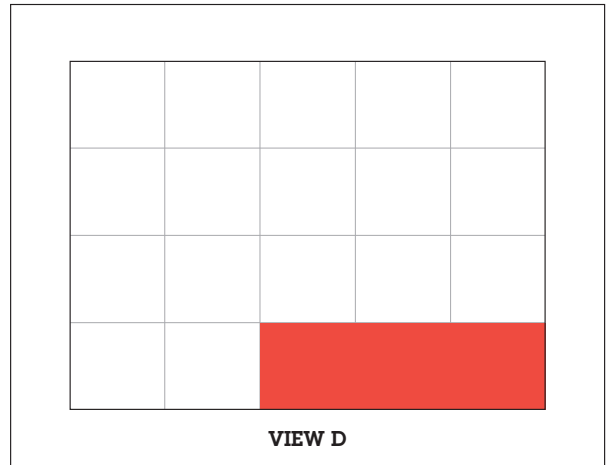
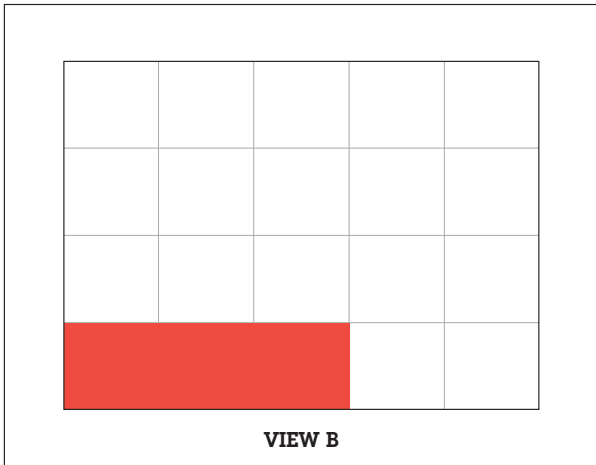
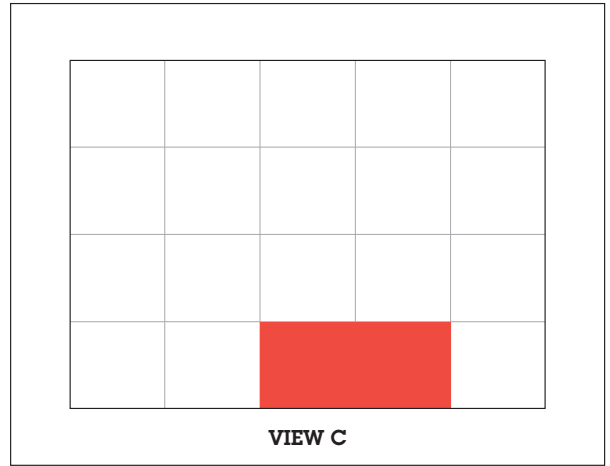
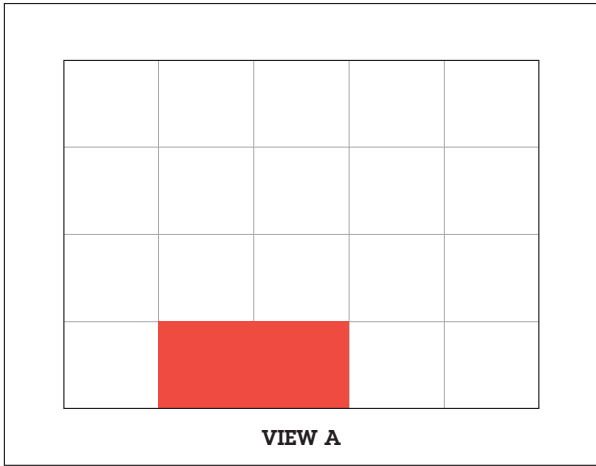


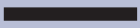
DIAGRAM 2



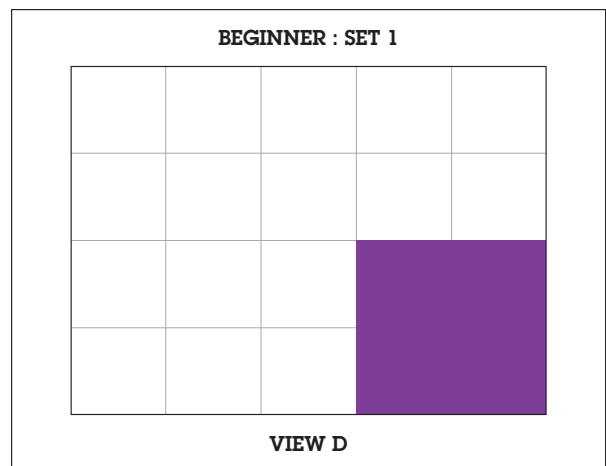
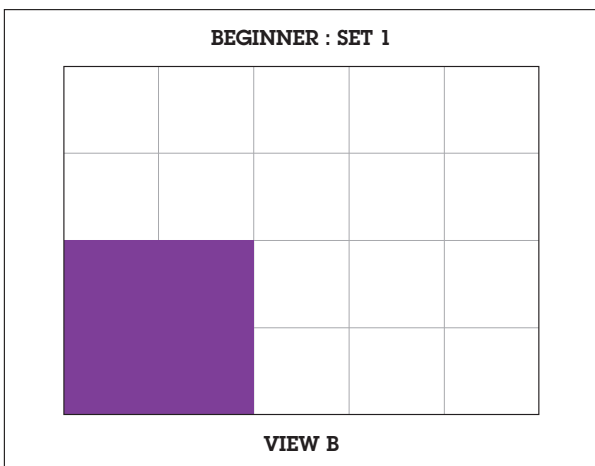
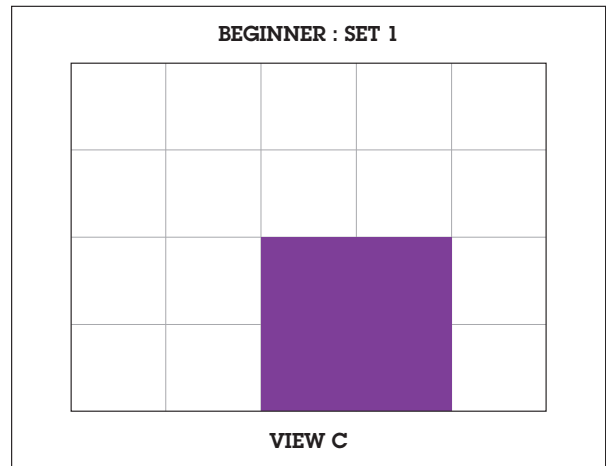
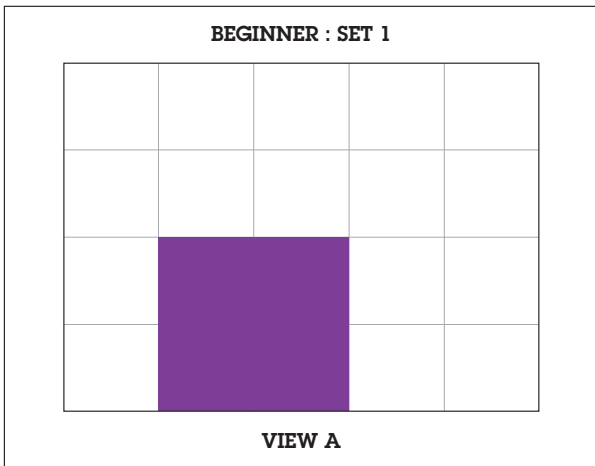
Beginner Level: 1

Block viewing cards

(sets 1 - 6)



BEGINNER SET 1



DISCUSSION

The view from all four perspectives is the same. The position of the block for each perspective may differ. The discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may already arise from this first set. It will depend on who started the arrangement (A,B,C or D) and where they placed the block to obtain their view.

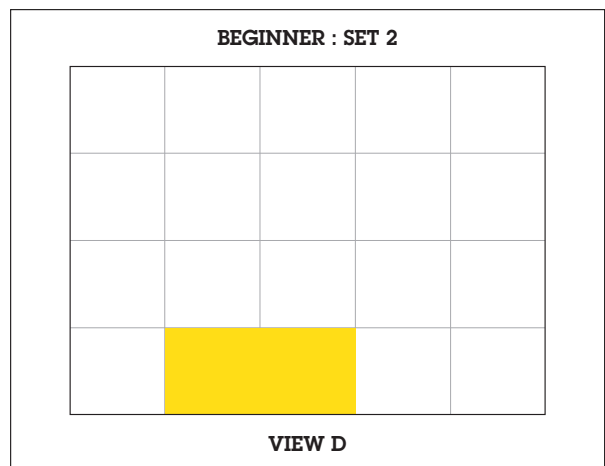
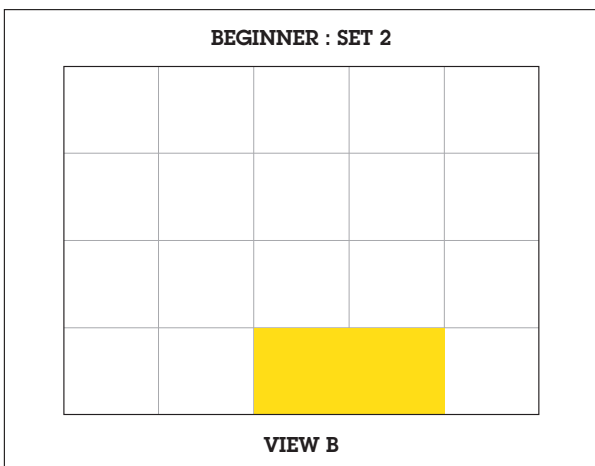
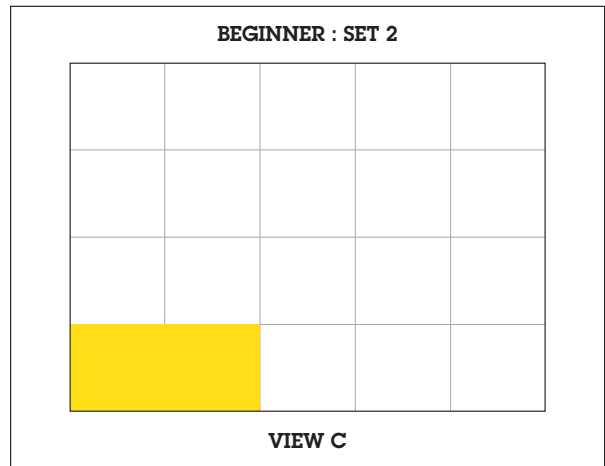
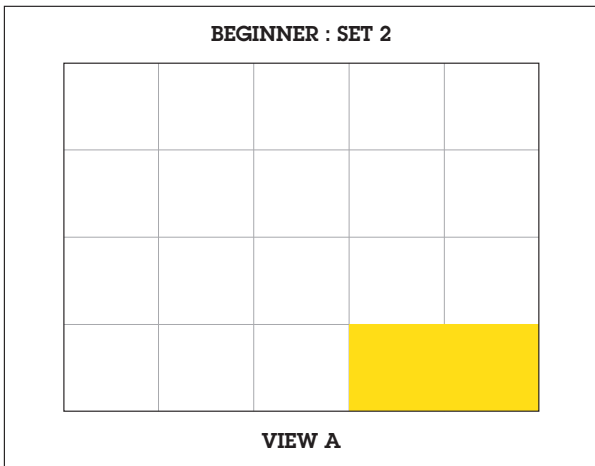
QUESTION

- Did you remember to look at the view from eye level?

EXTENSION QUESTION

- Is it possible to place the block on the grid in such a way that enables every view to be the same in terms of BOTH shape and position?

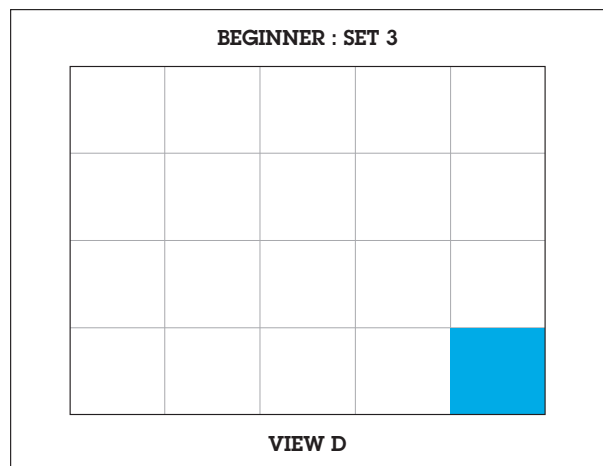
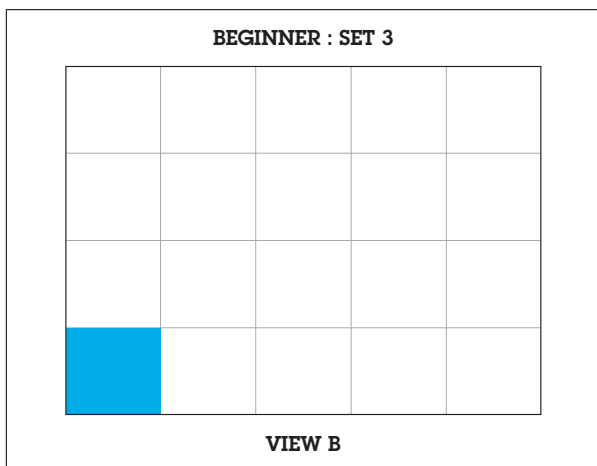
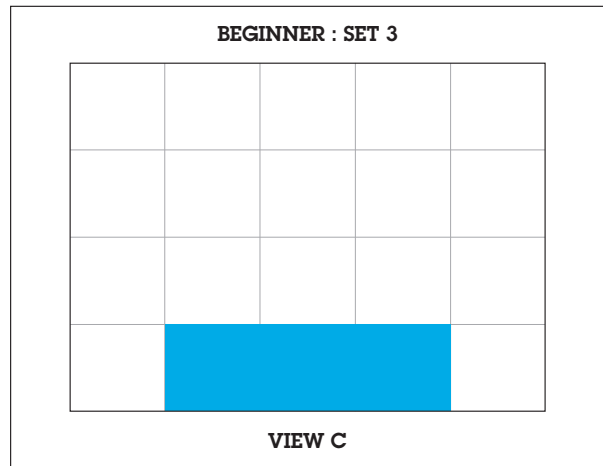
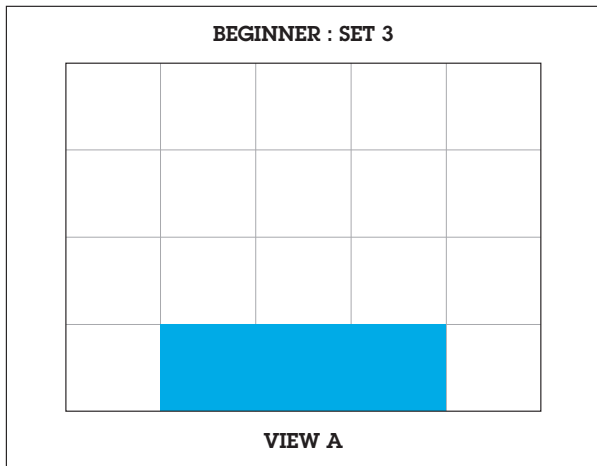
BEGINNER SET 2



DISCUSSION

In this set, the view from all four perspectives is still the same. The position of the block for each perspective may differ and the discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may also arise from this set. It will depend on who started the arrangement (A,B,C or D) and where they placed the block to obtain their view. The views are the same for each card, but we can now look at the orientation of the blocks on the grid – which are the same and which are different? Are any the same?

BEGINNER SET 3



DISCUSSION

The view from all four perspectives is not the same. However, the view for opposite sides is the same. The position of the block for each perspective may differ and the discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may also arise from this set. It will depend on who started the arrangement (A,B,C or D) and where they placed the block to obtain their view.

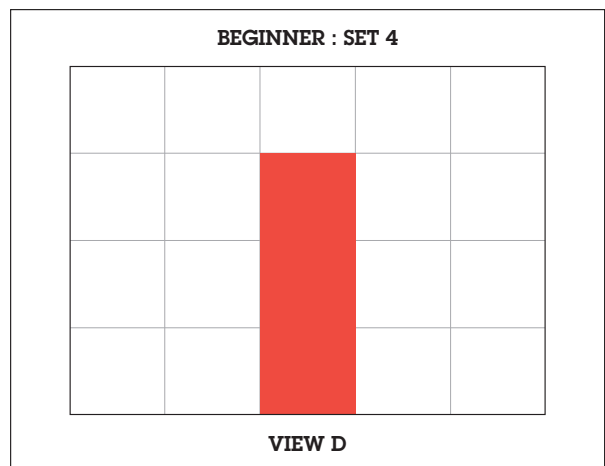
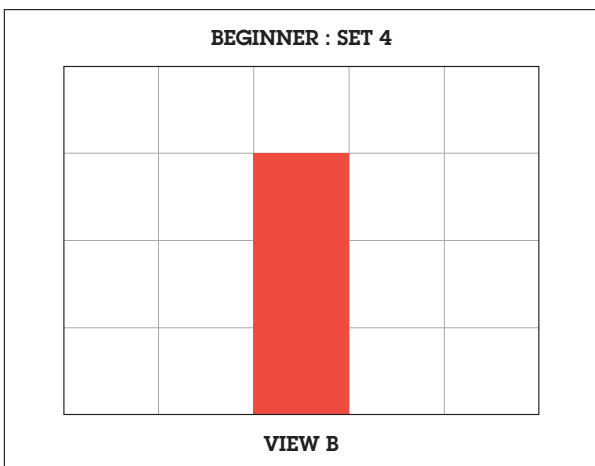
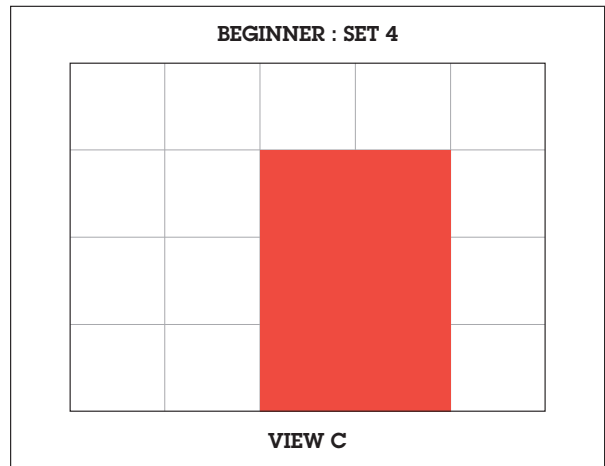
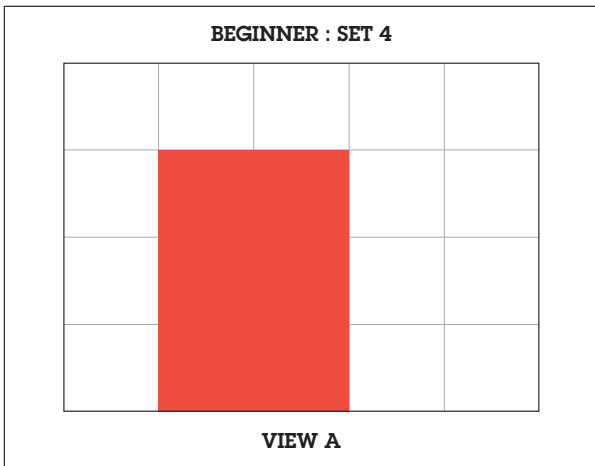
QUESTION

- Ask the children to compare views by asking which views are the same and which are different. Also ask which orientations on the grid are the same and which are different. Are any the same?

EXTENSION QUESTION

- Is there a way of placing this block on the grid so that the views are the same? Explain your thinking.

BEGINNER SET 4



DISCUSSION

The view from all four perspectives is not the same. However, the view for opposite sides is the same. The position of the block for each perspective may differ and the discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may also arise from this set. It will depend on who started the arrangement (A,B,C or D) and where they placed the block to obtain their view.

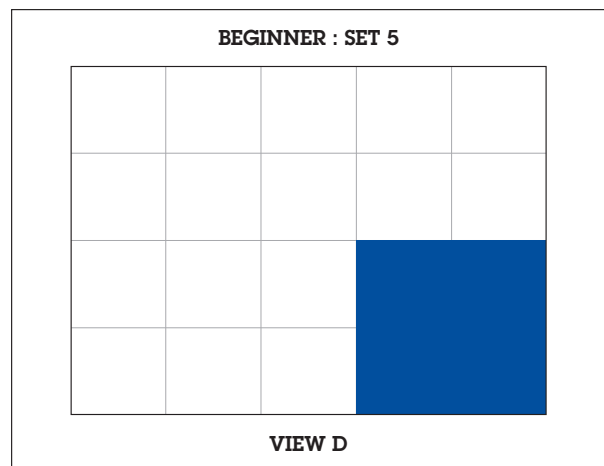
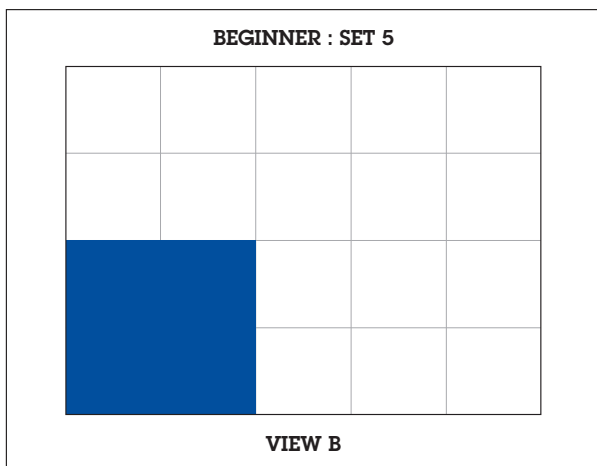
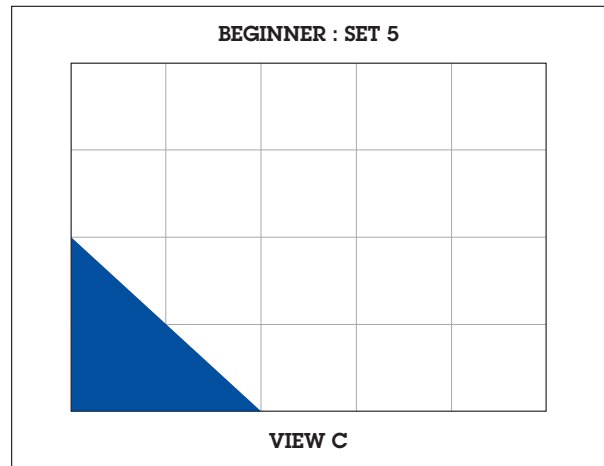
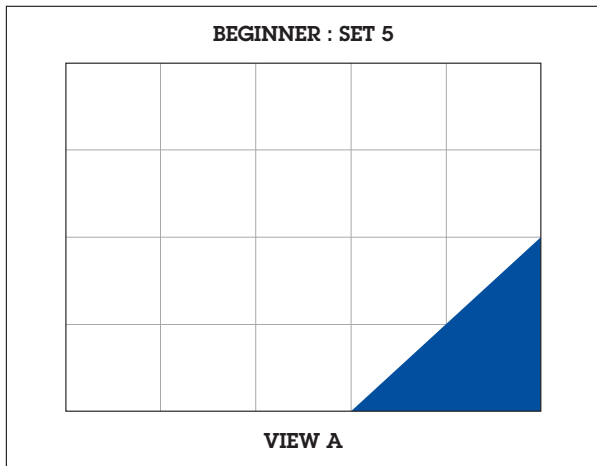
QUESTION

- Ask the children to compare views by asking which views are the same and which are different. Also ask which orientations on the grid are the same and which are different. Are any the same?

EXTENSION QUESTION

- Is there a way of placing this block on the grid so that all 4 views are the same? Explain your thinking.

BEGINNER SET 5



DISCUSSION

The view from all four perspectives is not the same. However, the view for opposite sides is the same. The position of the block for each perspective may differ and the discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may also arise from this set. It will depend on who started the arrangement (A,B,C or D) and where they placed the block to obtain their view.

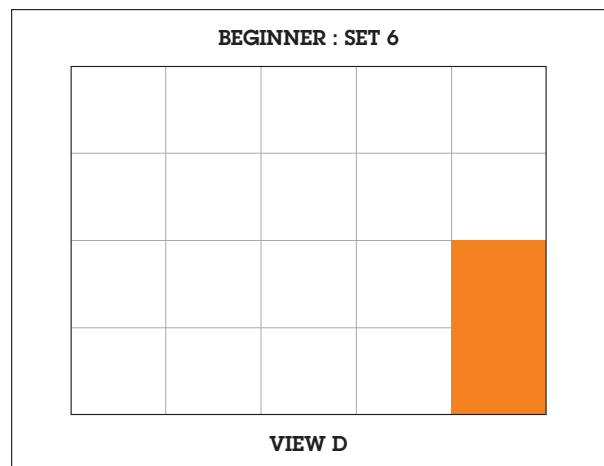
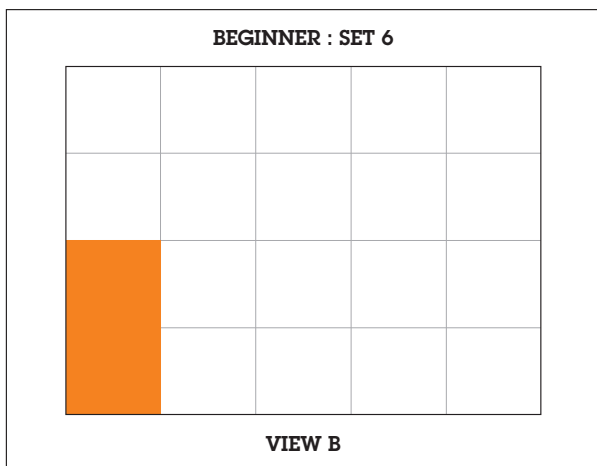
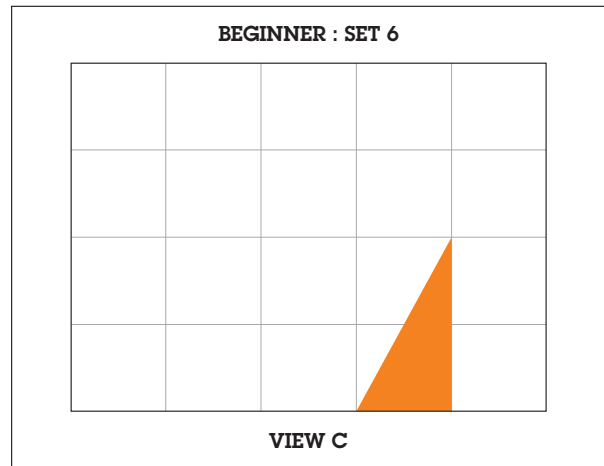
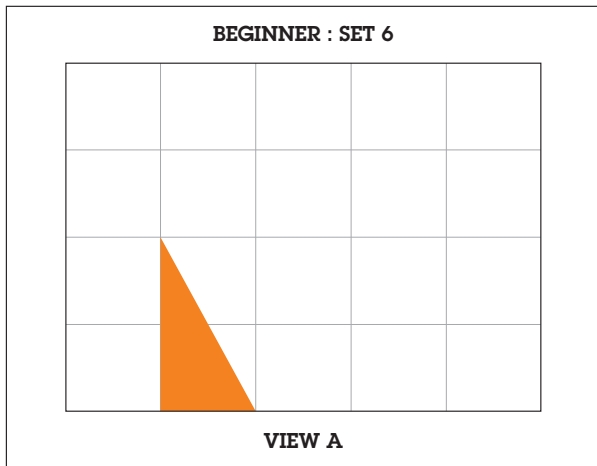
QUESTION

- Ask the children to compare views by asking which views are the same and which are different. Also ask which orientations on the grid are the same and which are different. Are any the same?
- What is different between the views for A and C and B and D? Could we define/recognise this 3D object from the views at B and D?
- Do the views from A and C give away more information as to the shape of the 3D object?

EXTENSION QUESTION

- Is there a way of placing this block so that all 4 views are the same? Explain your thinking.

BEGINNER SET 6



DISCUSSION

The view from all four perspectives is not the same. However, the view for opposite sides is the same.

The position of the block for each perspective may differ and the discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may also arise from this set. It will depend on who started the arrangement (A,B,C or D) and where they placed the block to obtain their view.

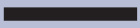
QUESTION

- Ask the children to compare views by asking which views are the same and which are different. Also ask which orientations on the grid are the same and which are different. Are any the same?
- What is different between the views for A and C and B and D? Could we define/recognise this 3D object from the views at B and D?
- Do the views from A and C give away more information as to the shape of the 3D object?

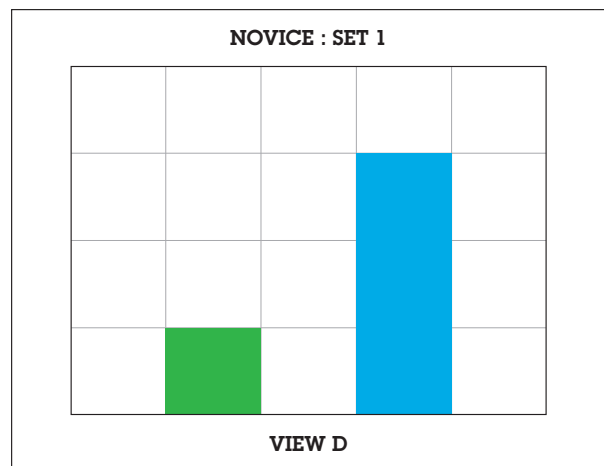
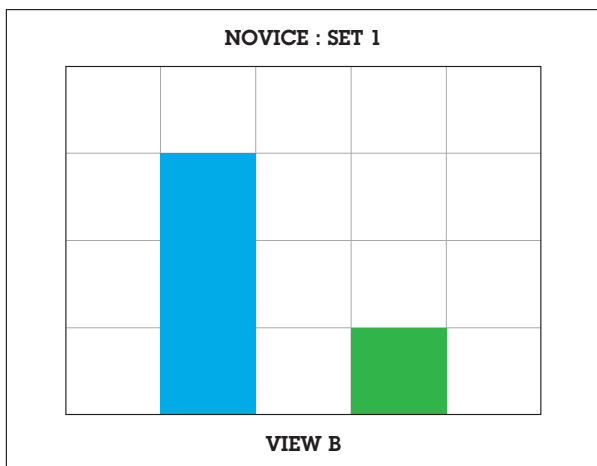
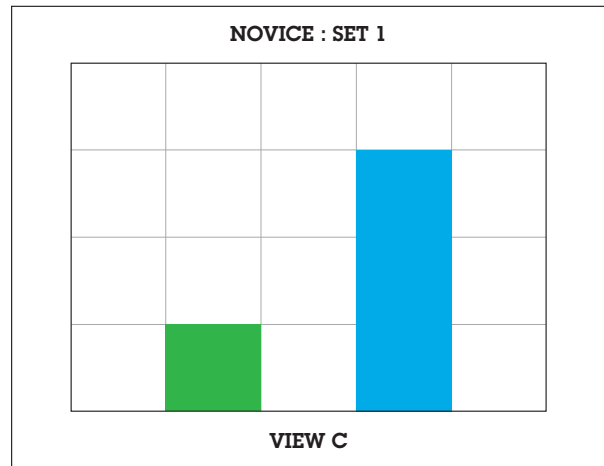
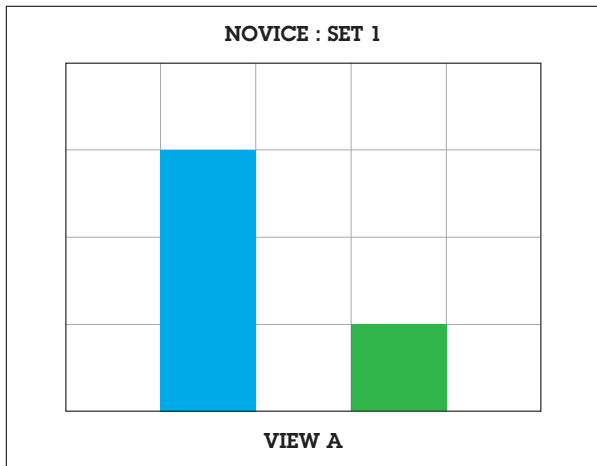
EXTENSION QUESTION

- What would happen to the views at A,B,C and D if this block was turned on its side? Discuss what you see from your perspective.

Novice Level: 2-3
Block viewing cards
(sets 1 - 10)



NOVICE SET 1



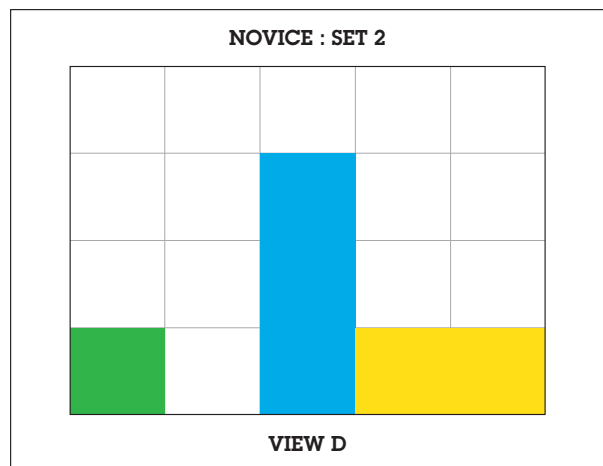
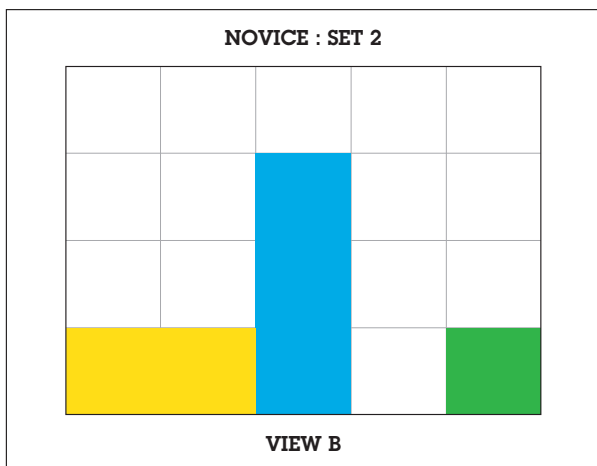
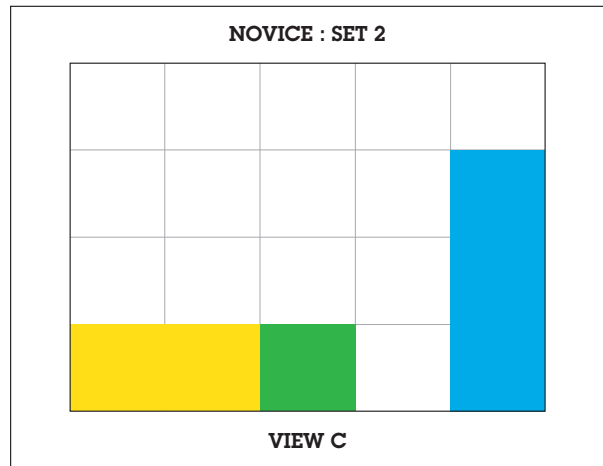
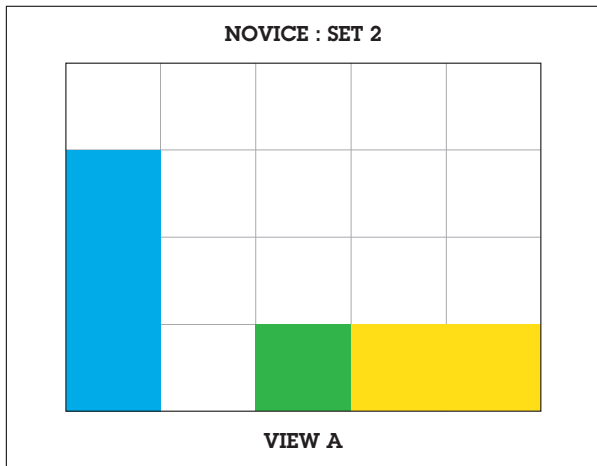
DISCUSSION

The view from all four perspectives is the same. However, the position of the block for each perspective differs. The discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may already arise from this first set.

QUESTION

- Did you remember to look at the view from eye level?

NOVICE SET 2



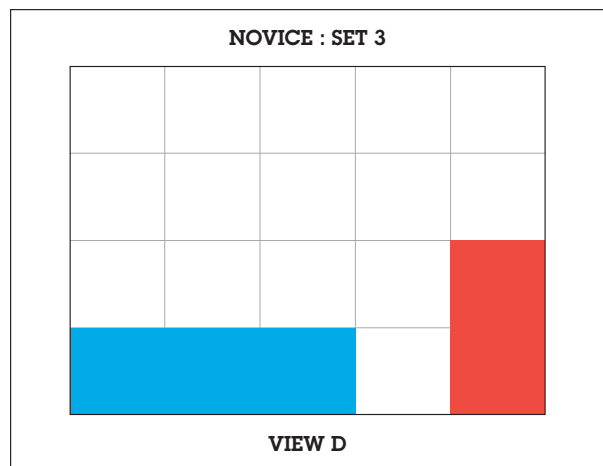
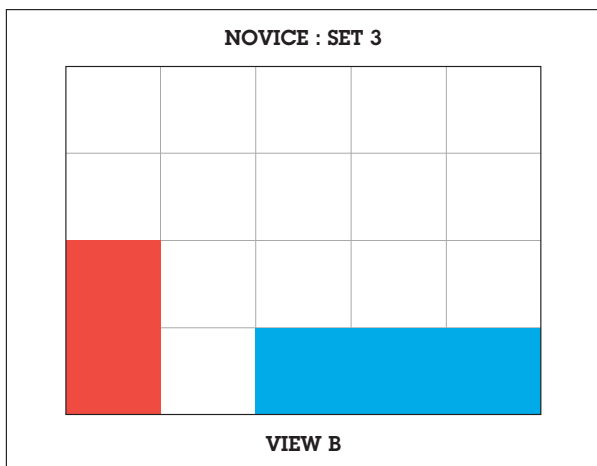
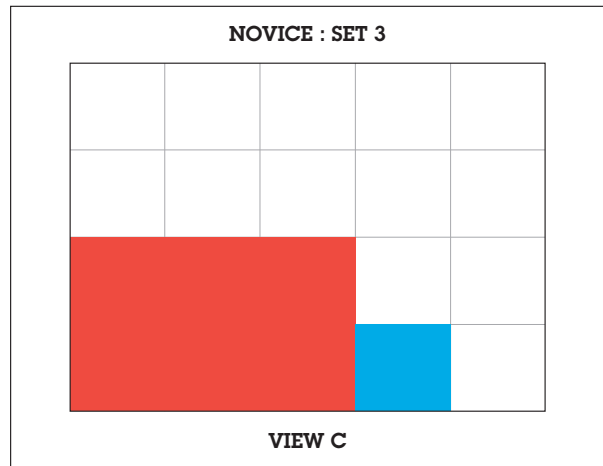
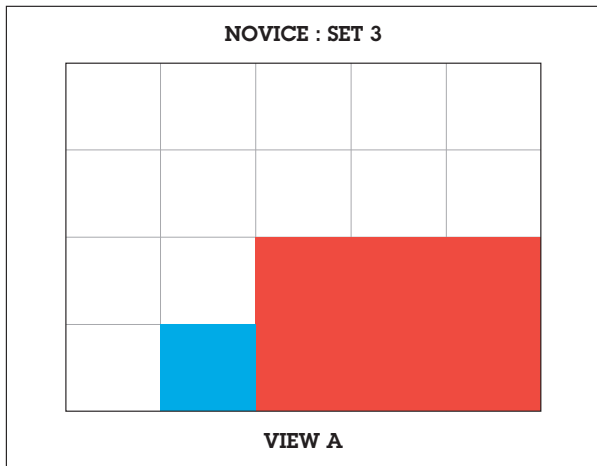
DISCUSSION

The view from all four perspectives is not the same. However, the view for opposite sides is the same. The position of the block for each perspective may differ and the discussion/awareness of the position of the block on the grid (i.e. how far away or close to the edge it is) may also arise from this set. It will depend on who started the arrangement (A,B,C or D) and where they placed the block to obtain their view.

QUESTION

- Ask the children to compare views by asking which views are the same and which are different.

NOVICE SET 3



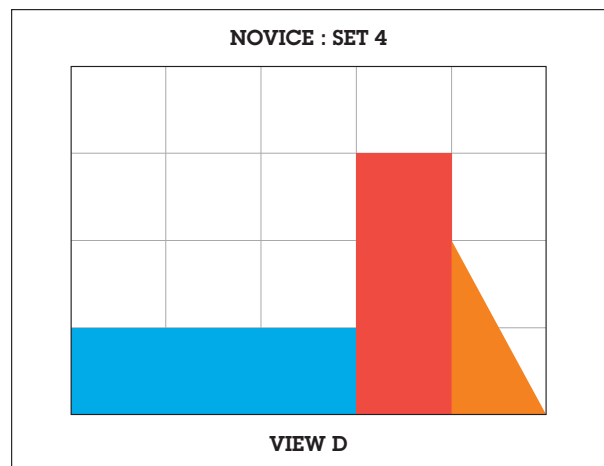
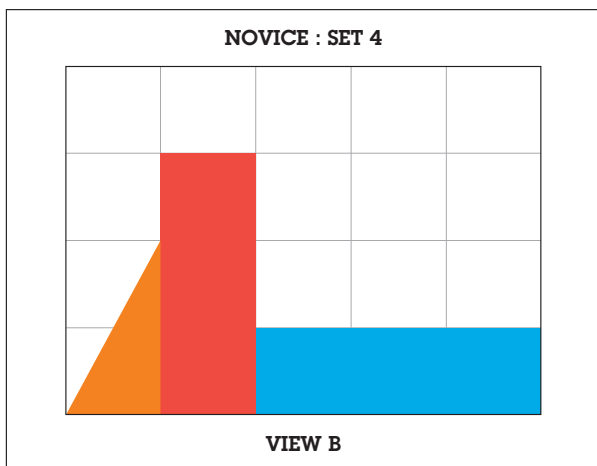
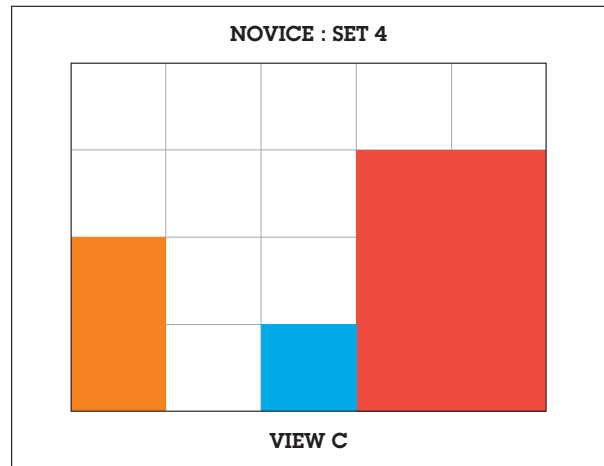
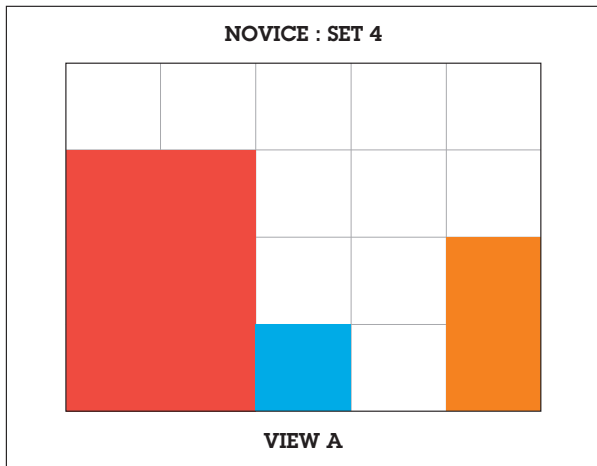
DISCUSSION

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QUESTION

- Ask the children to compare views by asking which views are the same and which are different.

NOVICE SET 4



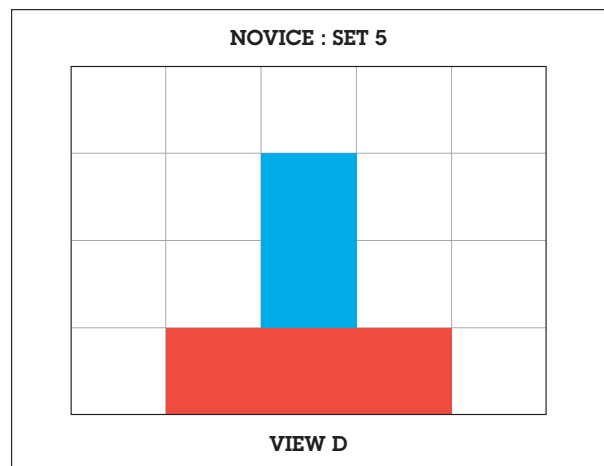
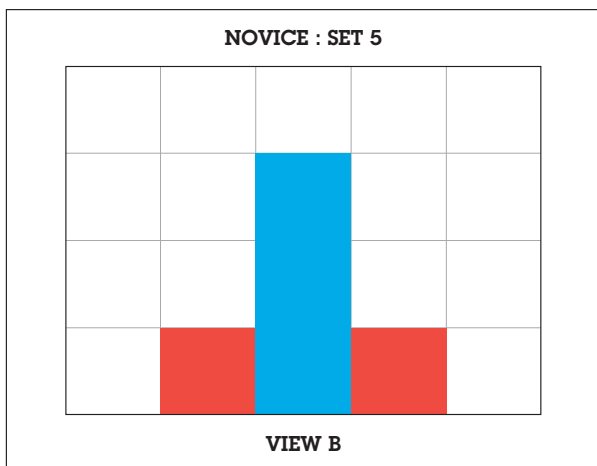
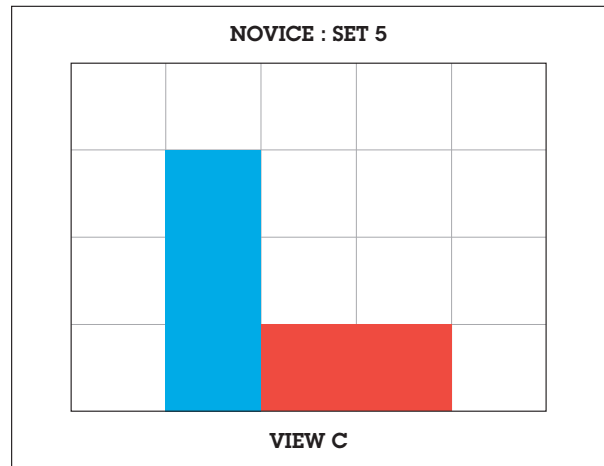
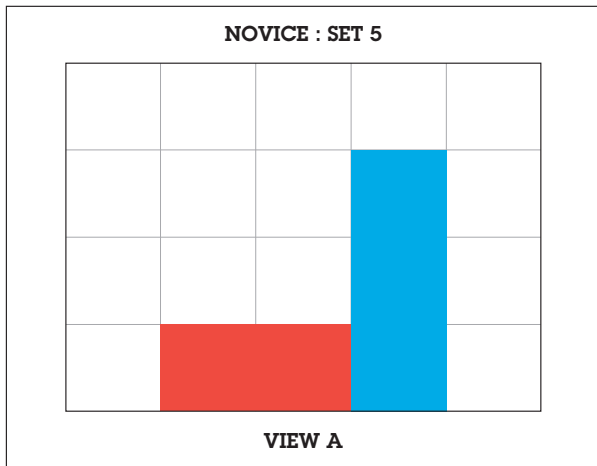
DISCUSSION

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QUESTION

- Ask the children to compare views by asking which views are the same and which are different.
- Ask the children to look at the different views for the triangular block (prism). Can it also be recognised as being triangular? Why or why not?

NOVICE SET 5



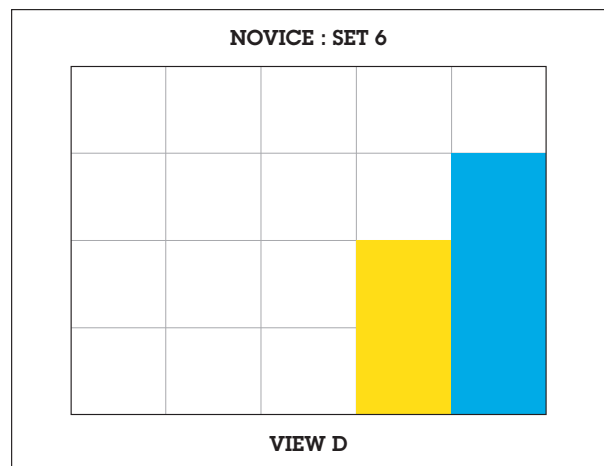
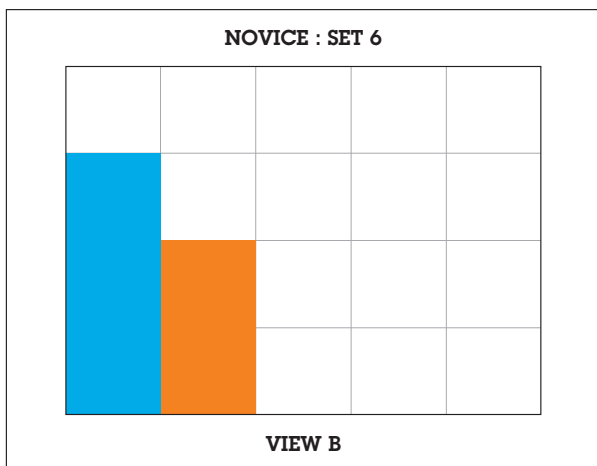
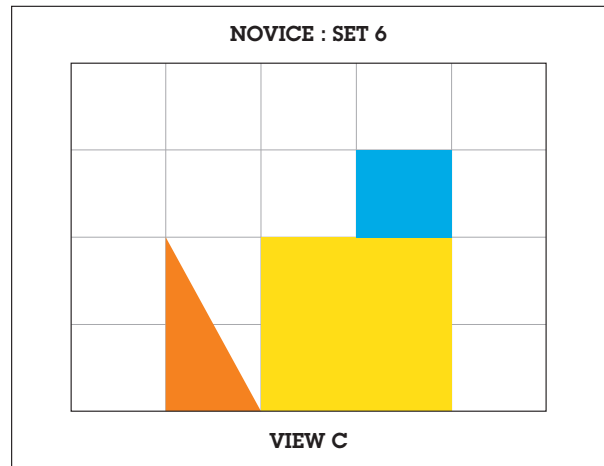
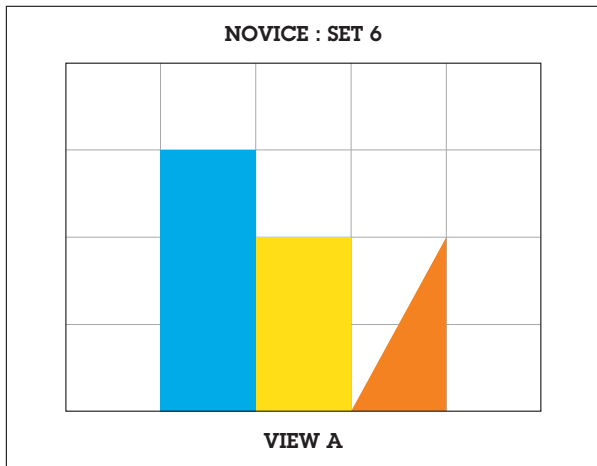
DISCUSSION

The view from all four perspectives is not the same, but the opposite views for A and C are. This is the first time that the children will be exposed to the concept that views/parts thereof can be hidden or concealed. Ask them why they think the opposite views are not the same. The position of the block for each perspective plays a very important role. If the game starts at A or C, then there are a few variations of block placement that can achieve this view, but that impacts the views at B and D. If the game starts at B or D, then the block placement is a little more obvious.

QUESTION

- Ask the children to compare views by asking which views are the same and which are different and what challenges they had in all agreeing on their view.

NOVICE SET 6



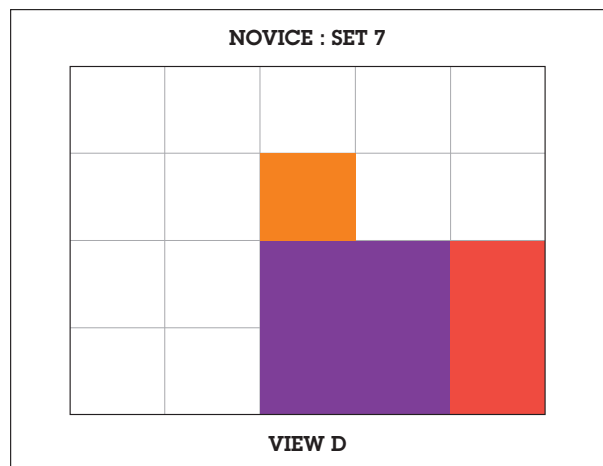
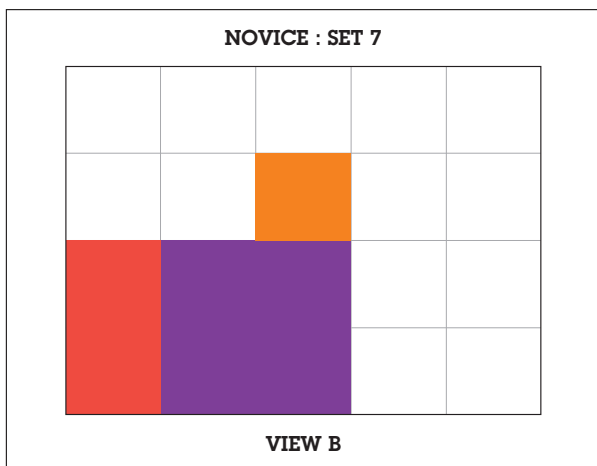
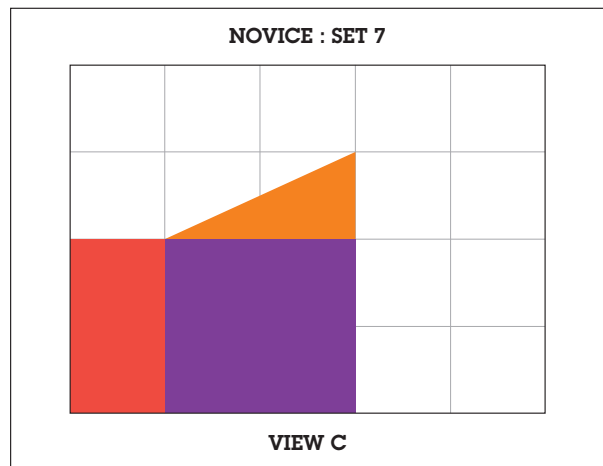
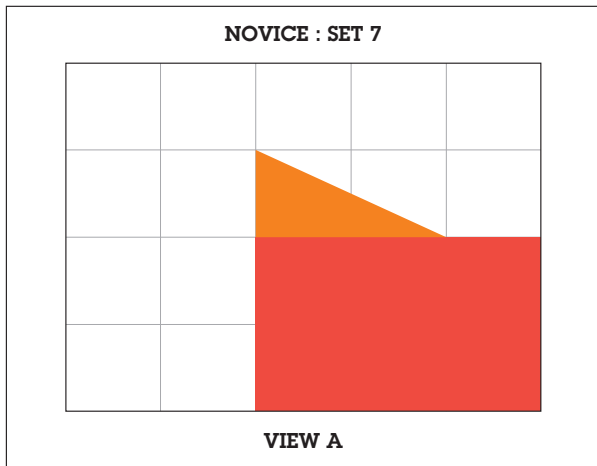
DISCUSSION

All 4 views are different. The children are again exposed to the concept that views/parts thereof can be hidden or concealed. It is the first time that not all 4 views can see all 3 blocks or at least parts thereof. Ask them why they think none of the views are the same. The position of the block from each perspective plays a very important role. If the game starts at A or D, there are a few variations of block placement that can achieve this view, but that impacts the views at B and C. If the game starts at B or D, then the children will only place 2 out of the 3 blocks as the third block is hidden from their view.

QUESTION

- Ask the children what challenges they had in all agreeing on their view.

NOVICE SET 7



DISCUSSION

The view from all four perspectives is not the same, but the opposite views for B and D are. The triangular block presents an interesting challenge here as the slope face of the block appears to be longer than the vertical face. Because we can't show the slope (depth) on a 2D card, it will appear the same as the vertical face.

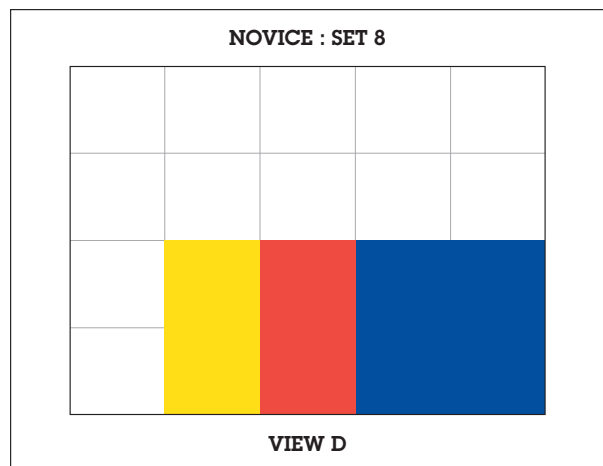
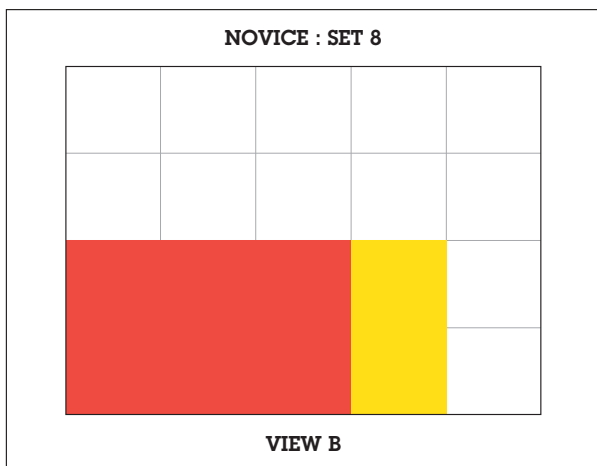
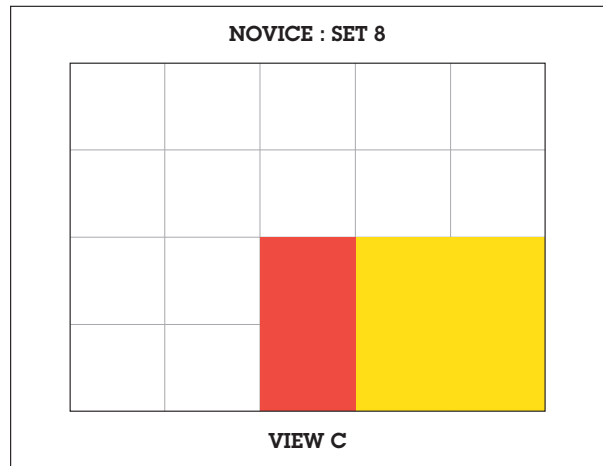
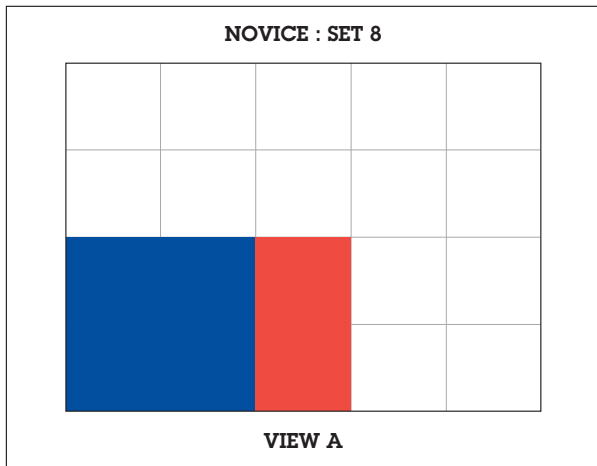
QUESTION

- Have a look at the purple block from all 4 views. Why do you think the purple block has the same view from all perspectives?

NOTE

Once again, the fact that some of the blocks are hidden by others for certain views is a factor in placement.

NOVICE SET 8



DISCUSSION

The views from all 4 perspectives are different. Why do you think this is? The triangular block (prism) presents an interesting challenge here as other than the colour, there is no indication from any of the views that it is triangular. This block can be viewed like this by a variation of placements, so this presents the challenge of which placement is correct for all 4 views.

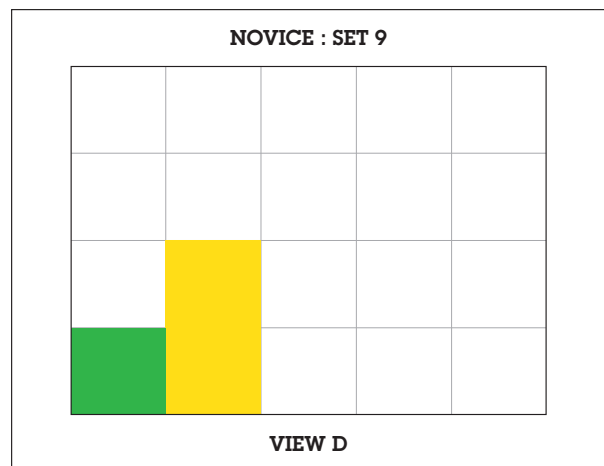
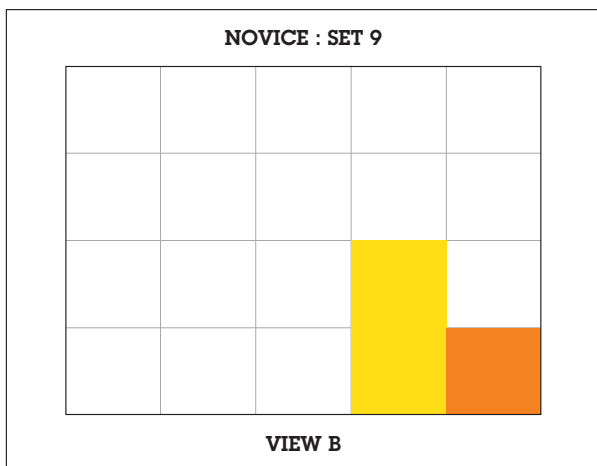
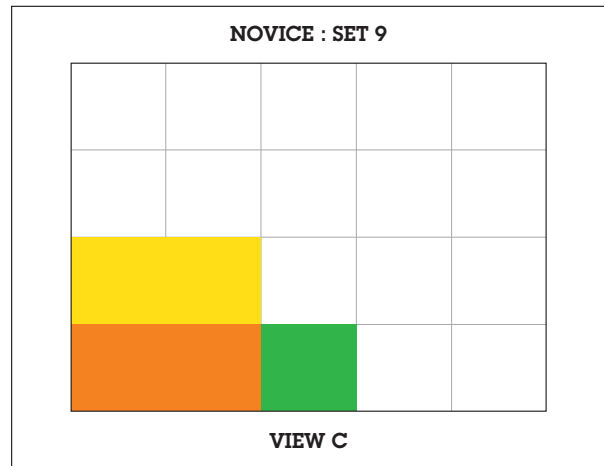
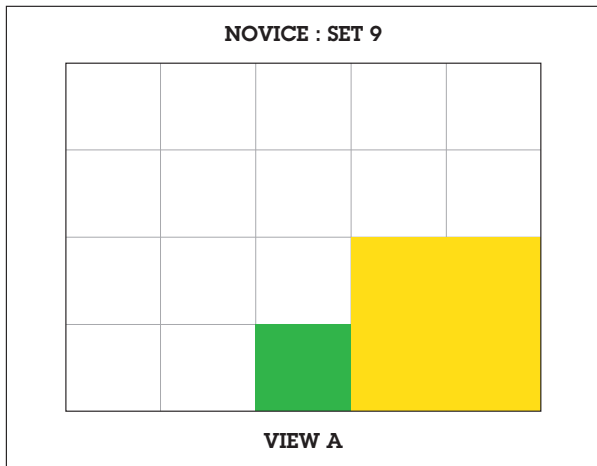
QUESTION

- What would we need to see in order to recognise the triangular block (prism) as such, if there was no colour to guide us? Discuss.

NOTE

Once again the fact that some of the blocks are hidden by others for certain views is a factor in placement.

NOVICE SET 9



DISCUSSION

The views from all 4 perspectives are different. Why do you think this is?

The triangular block (prism) presents an interesting challenge here as other than the colour, there is no indication from any of the views, that it is triangular.

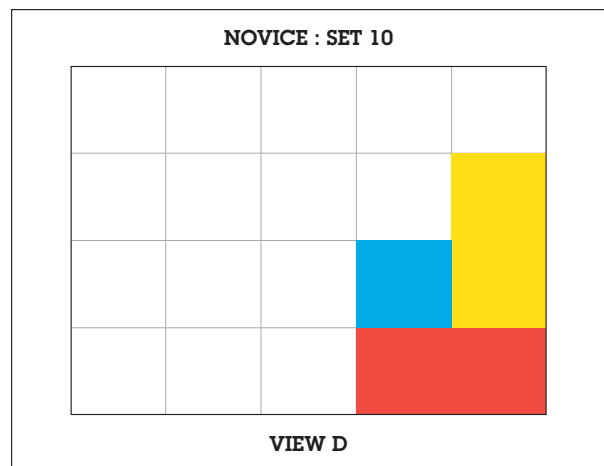
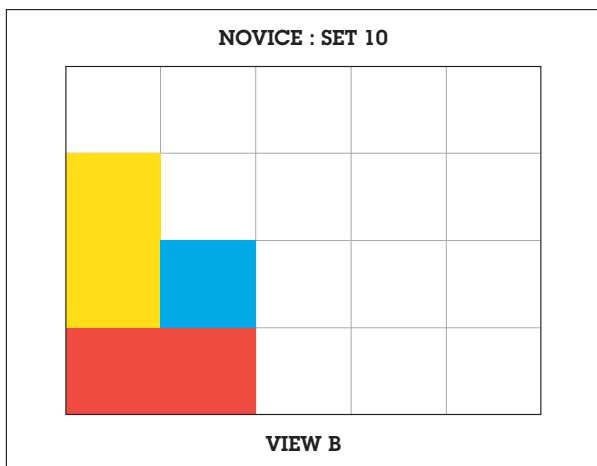
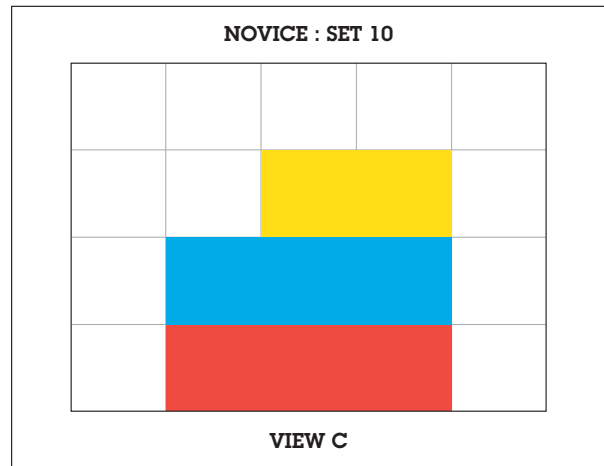
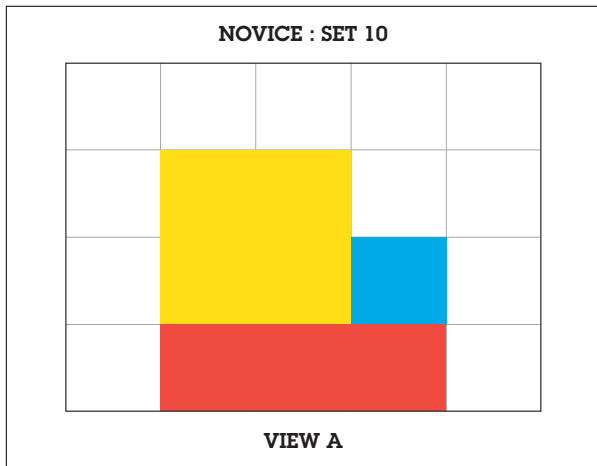
QUESTION

- Is there a difference in views for this triangular block compared to the blue triangular block (prism) used in the previous set? Discuss. What is the same and what is different for these 2 triangular blocks (prisms)?
- What would we need to see in order to recognise the triangular block (prism) as such, if there was no colour to guide us? Discuss.

NOTE

Once again the fact that some of the blocks are hidden by others for certain views is a factor in placement.

NOVICE SET 10



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DISCUSSION

The view from all four perspectives is not the same but the opposite views for B and D are. Was this arrangement easier or more challenging than the previous set? Discuss what makes a set more challenging than another (discuss in relation to blocks used, placement and orientation on the grid).

QUESTION

Look at all the blocks.

- Which blocks can be viewed in 3 or more different ways?
- What makes these blocks different to the others?

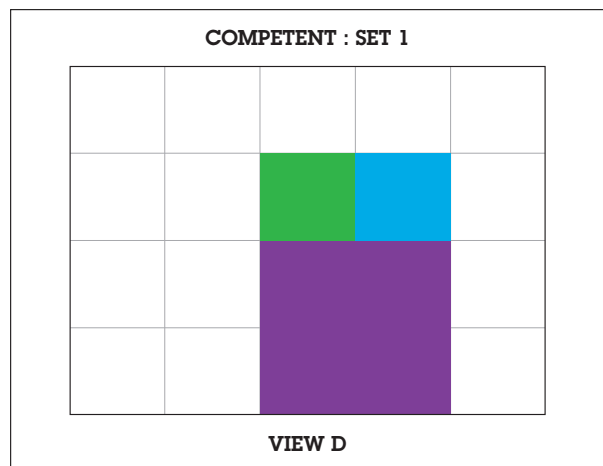
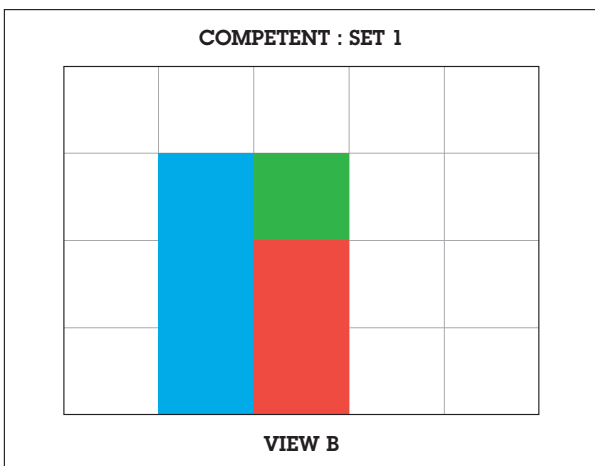
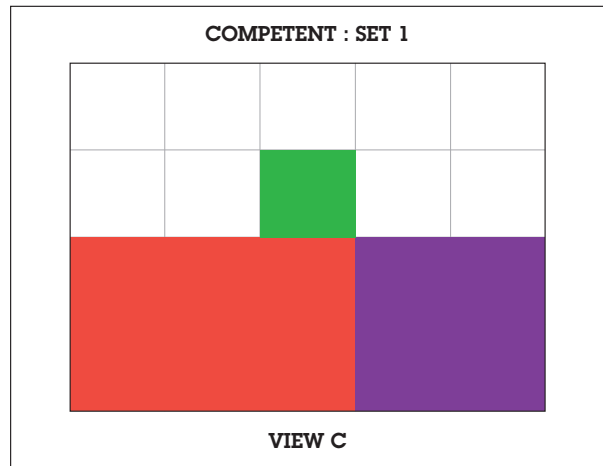
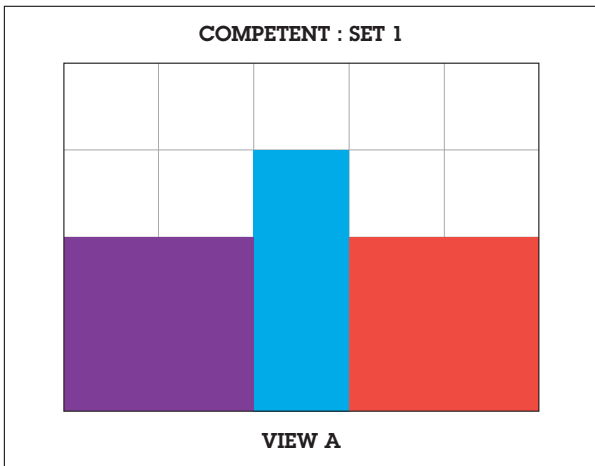
Competent Level: 4-7

Block viewing cards

(sets 1 - 8)



COMPETENT SET 1



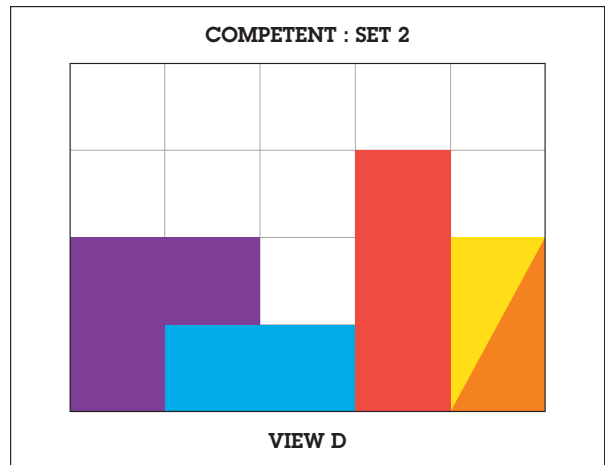
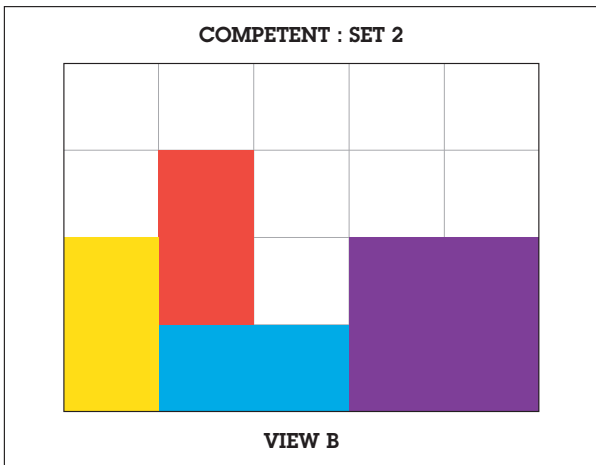
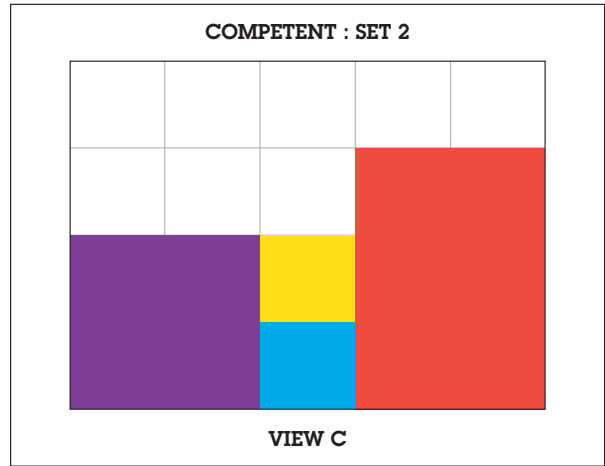
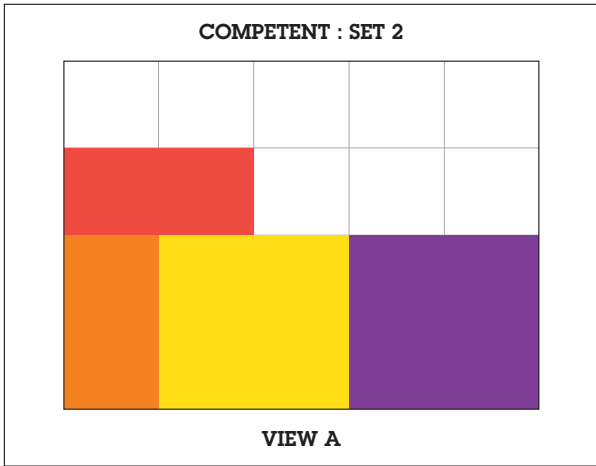
DISCUSSION

The view from all four perspectives is different, and yet 3 of the 4 shapes used in this arrangement have the same view from all 4 perspectives if they were standing alone. Why do you think the 4 views are then different? 4 blocks are used in this set. Are all 4 blocks visible from any one or more view? Why or why not?

QUESTION

- Did you remember to look at the view from eye level?

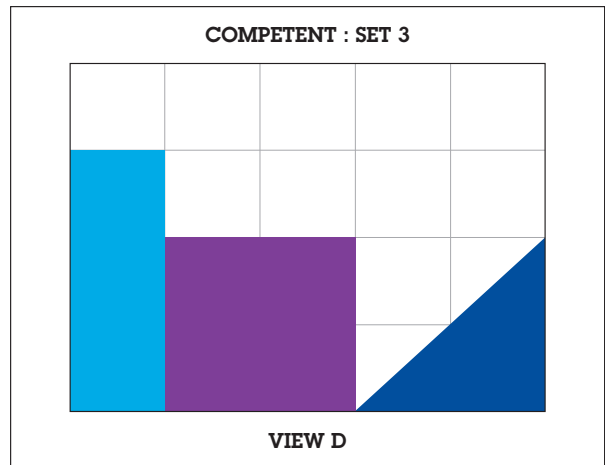
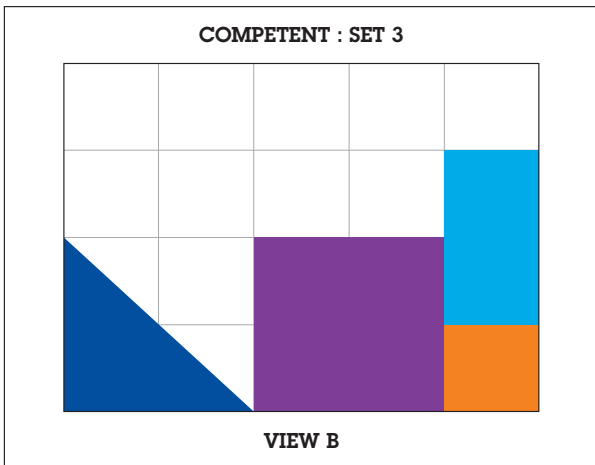
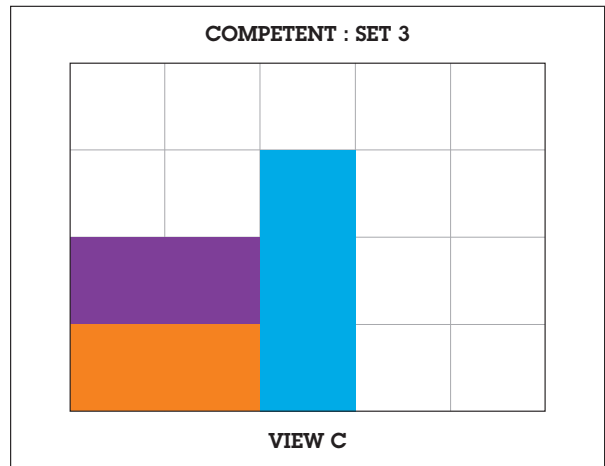
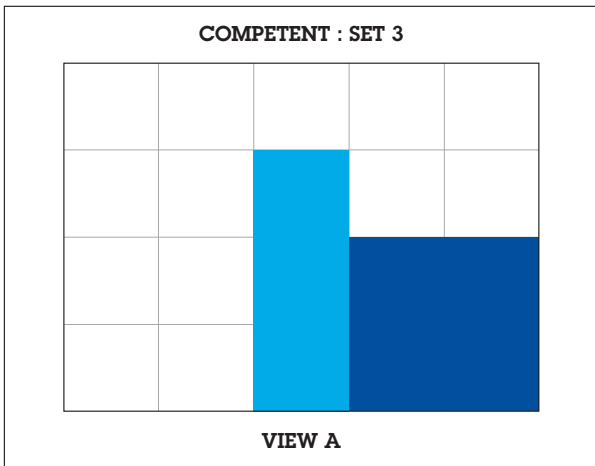
COMPETENT SET 2



DISCUSSION

The view from all four perspectives is different. 5 blocks are used in this set. Are all 5 blocks visible from any one or more view. Why or why not?

COMPETENT SET 3



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DISCUSSION

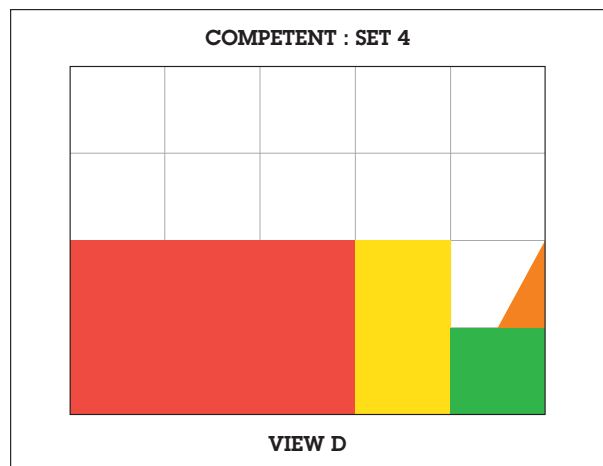
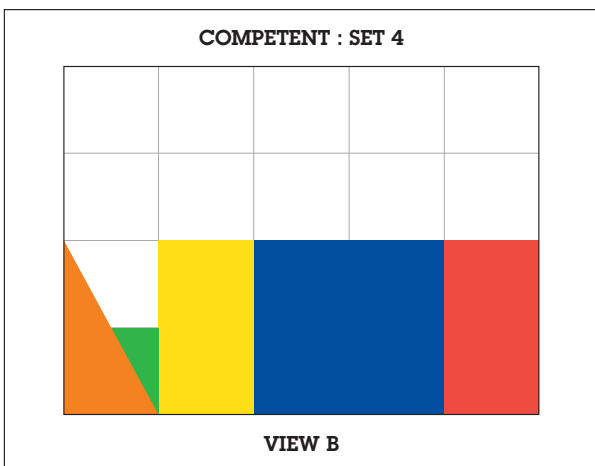
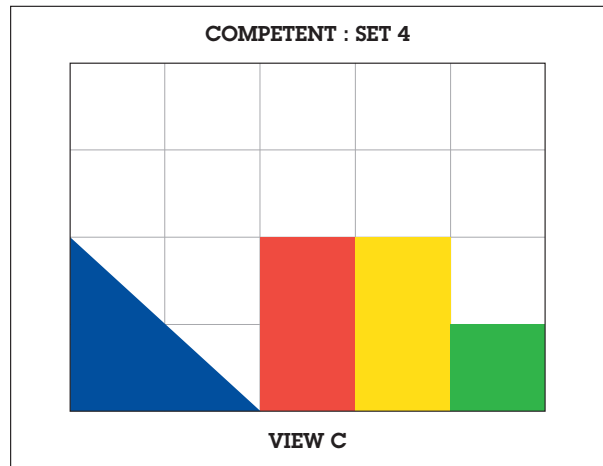
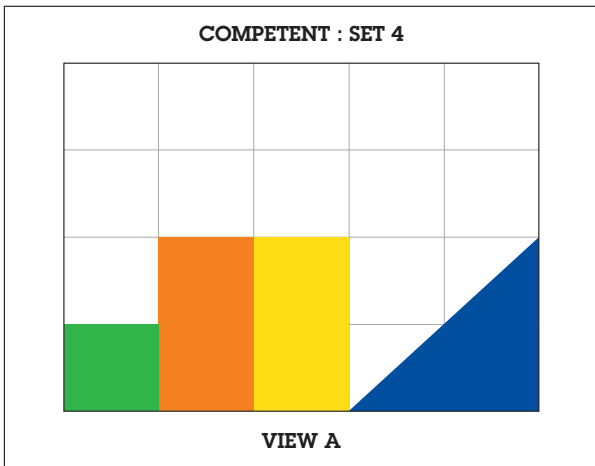
The view from all four perspectives is different. 4 blocks are used in this set. Are all 4 blocks visible from any one or more view? Why or why not?

QUESTION

We know from experience that the orange block is triangular.

- Is there any indication from any view, that the orange block is in fact triangular?
- From which views is the dark blue block clearly triangular?
- How would the orange block need to be positioned so that from at least one view it is seen as triangular?

COMPETENT SET 4



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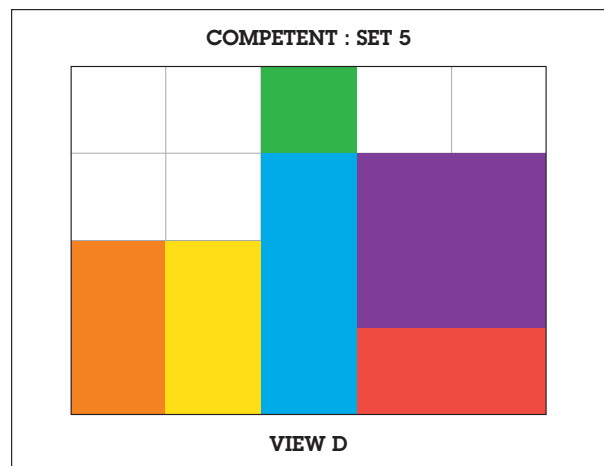
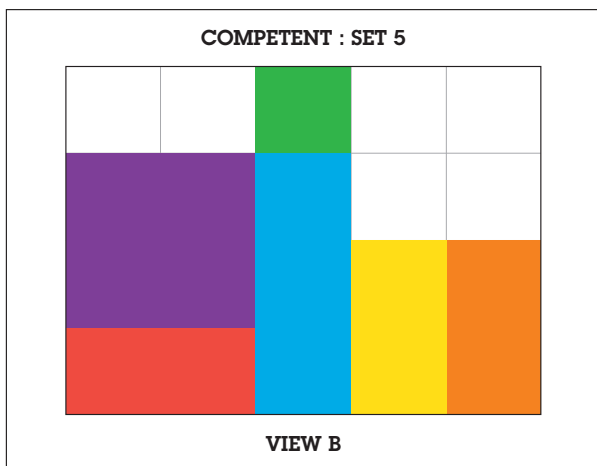
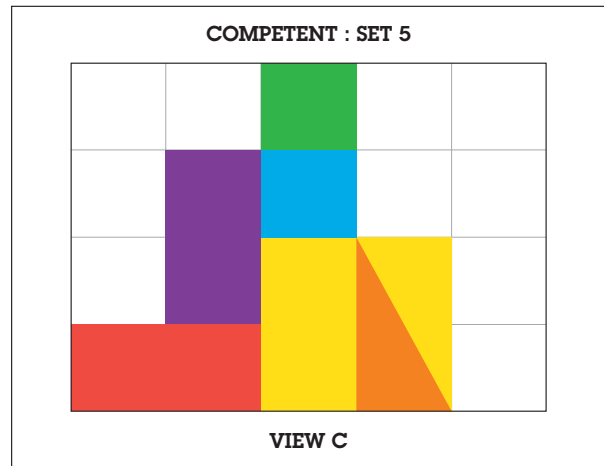
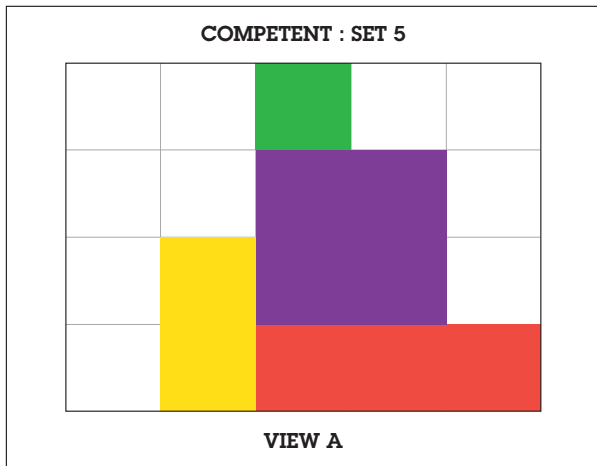
DISCUSSION

The view from all four perspectives is different. 5 blocks are used in this set. Are all 5 blocks visible from any one or more view? Why or why not?

QUESTION

- Once again, both triangular blocks (prisms) are used. From which views are they clearly triangular?
- From which views can they not be identified as triangular?
- What aspect of these blocks do we need to see in order to identify them as triangular in a 2D view?

COMPETENT SET 5



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DISCUSSION

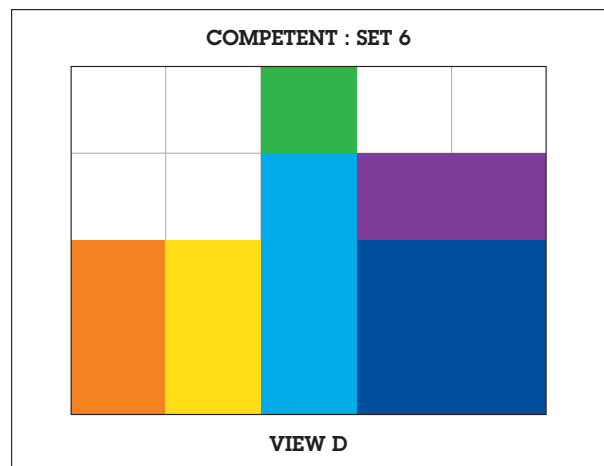
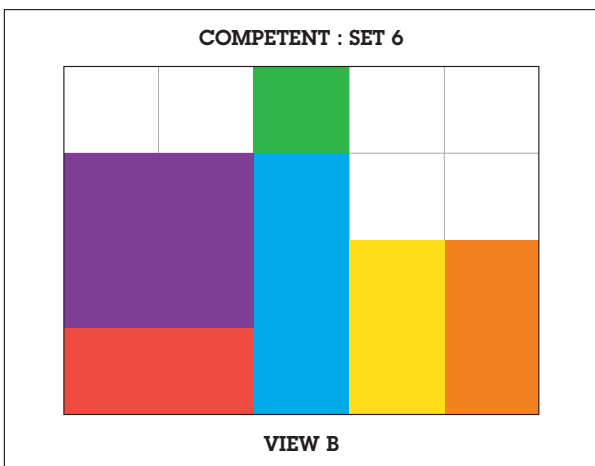
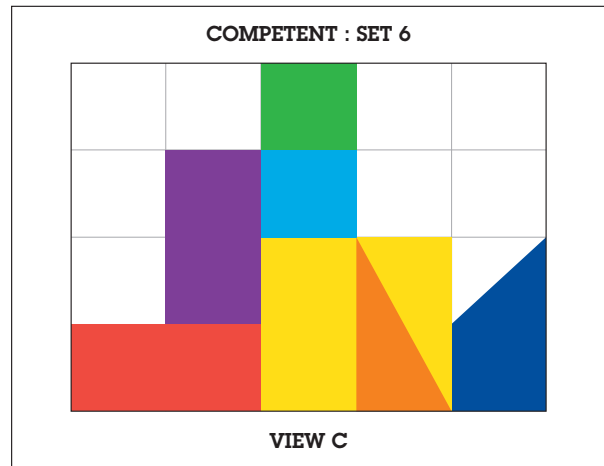
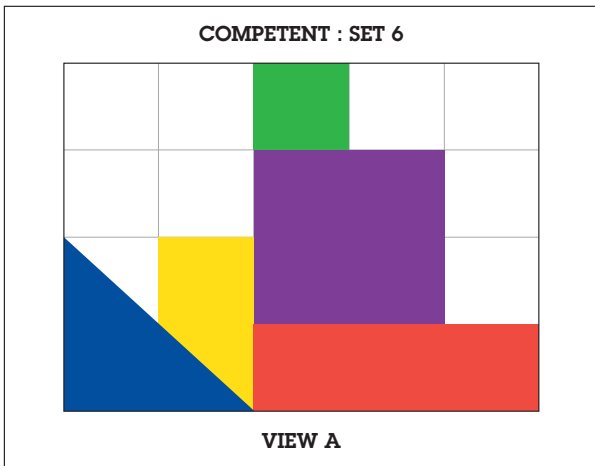
The view from all four perspectives is not the same. However, the views for opposite sides B and D are the same. Why are the views for A and C not the same when the views for B and D are? 6 blocks are used in this set. From which views are all 6 visible or partly visible? Why are all 6 blocks visible from some views and not from others?

Once again note the different views of the triangular block (prism). From which view is the 2D representation of this block triangular? And why not for the other views?

QUESTION

- Is there any way of placing these blocks so that all 6 are visible from all views?

COMPETENT SET 6



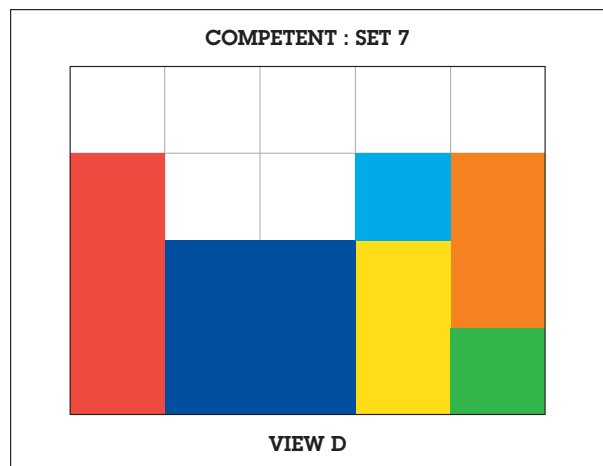
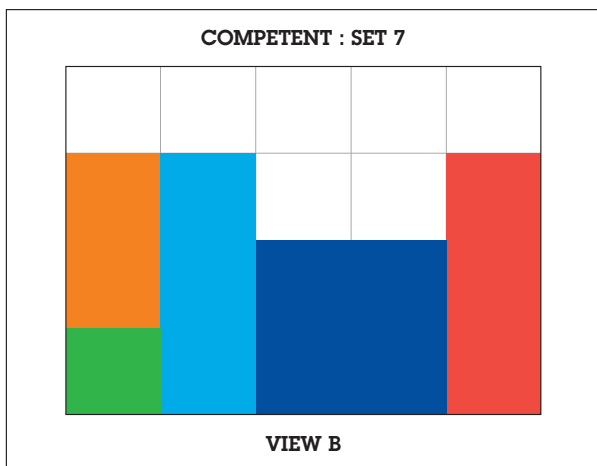
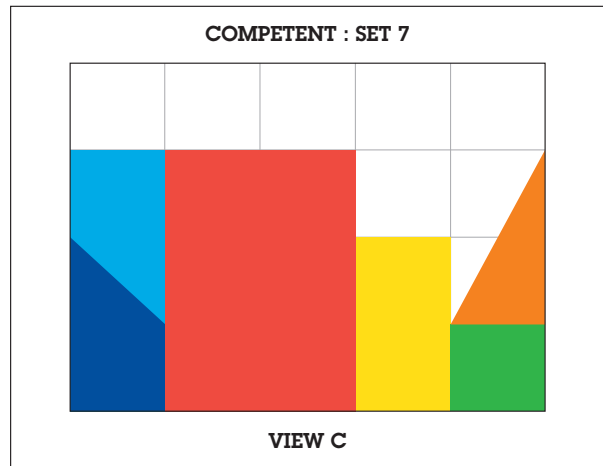
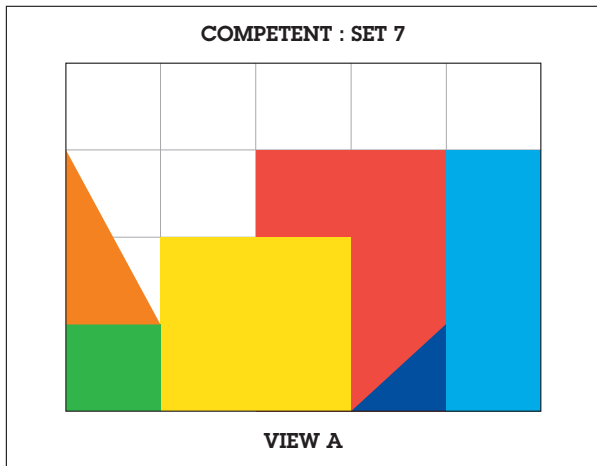
DISCUSSION

The view from all four perspectives is not the same. There are now 7 blocks. The only change from the previous set is that the blue triangular block (prism) was added. Why, if we only added one block, and made no other changes, are views B and D not the same for this arrangement? How has the placement of this block changed the other views, or has it?

NOTE

Once again note the different views of the triangular blocks (prisms). Look at view C. Part of the blue triangular block (prism) is concealed by the yellow block. Can we still identify this blue block as triangular? Explain.

COMPETENT SET 7



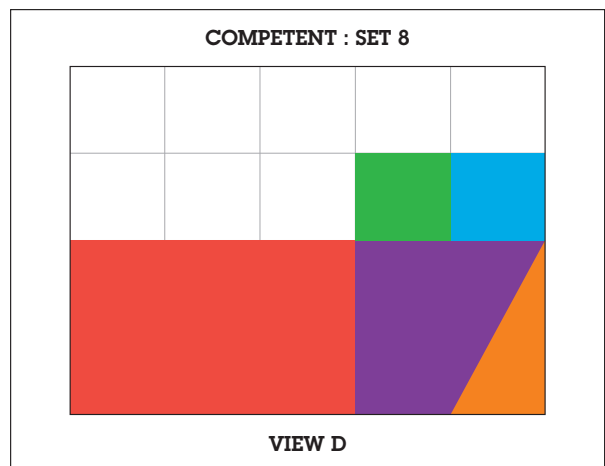
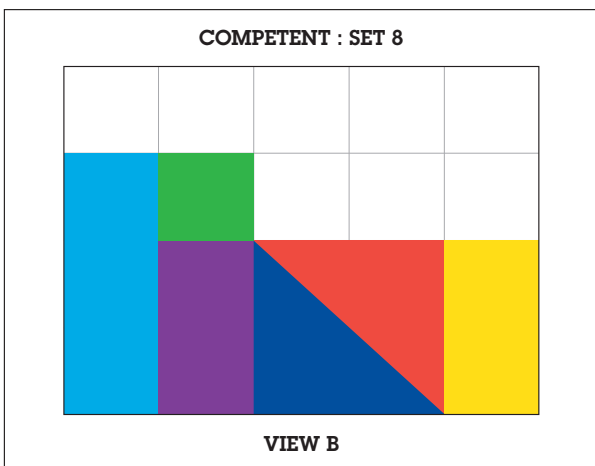
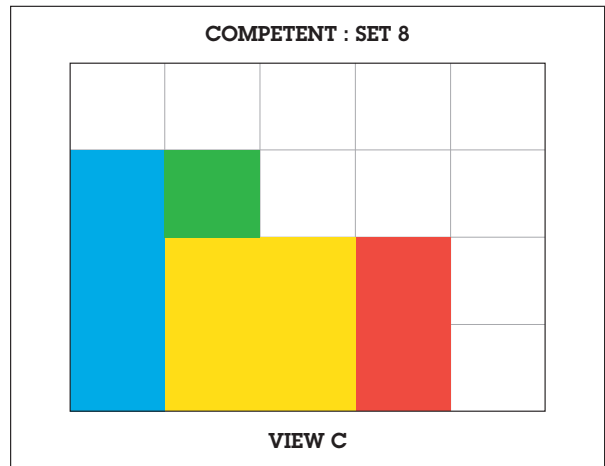
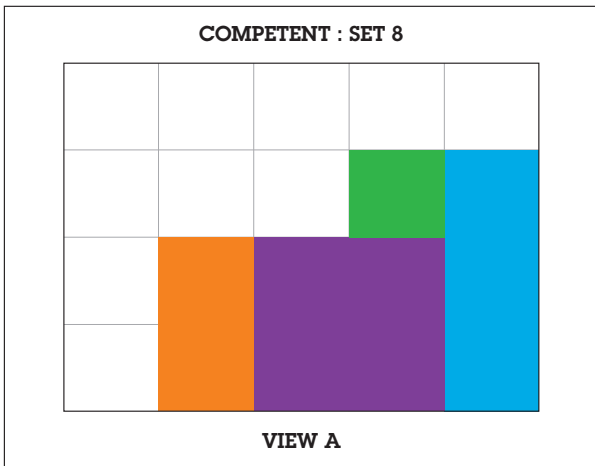
DISCUSSION

The view from all four perspectives is not the same. There are 6 blocks in this arrangement. Can you see all 6 blocks from your view? If not, why? Is there another way of arranging these 6 blocks so that all 6 are visible from all views?

QUESTION

- How does moving the blocks forwards and backwards on the grid for each view change the views from the other perspectives?

COMPETENT SET 8



DISCUSSION

The view from all four perspectives is not the same. 7 blocks are used in this set. Is it possible to make an arrangement with 7 blocks so that all 7 are visible or partly visible? Or visible from 1 or more views? Investigate.

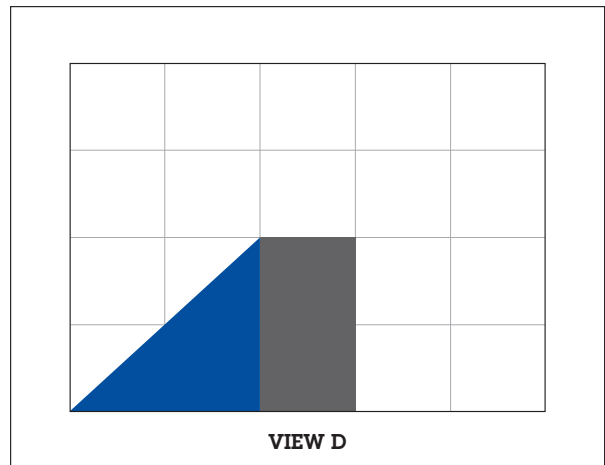
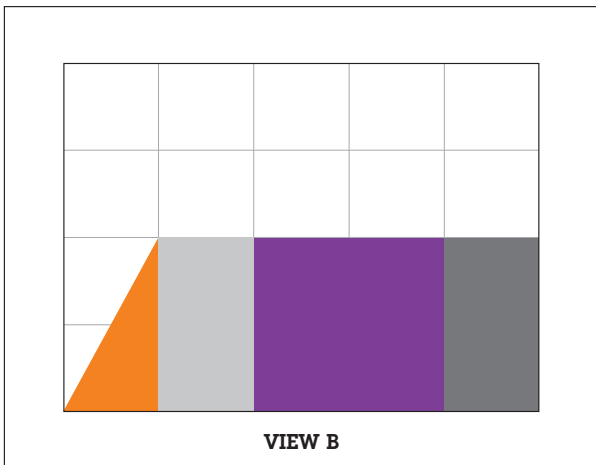
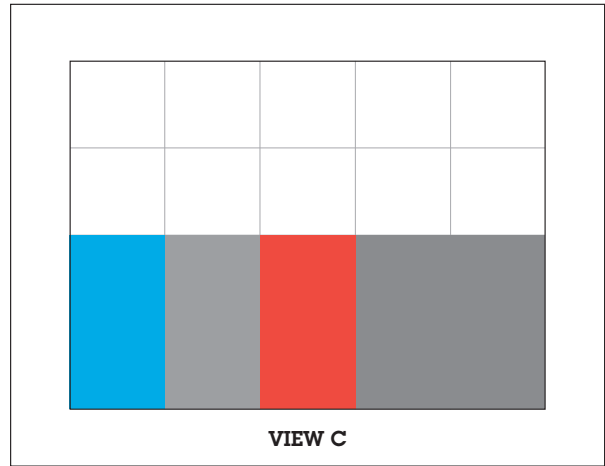
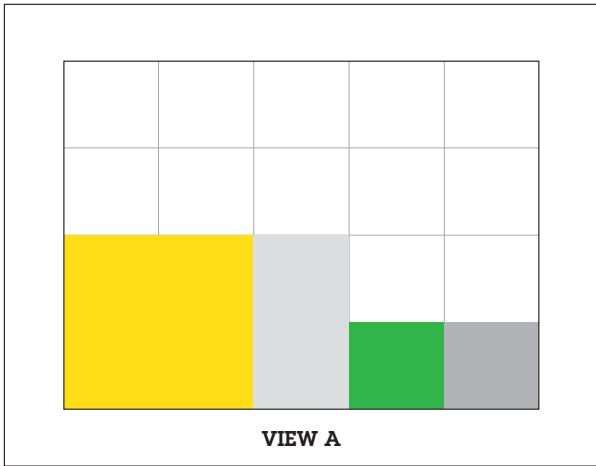
QUESTION

- Why is the green block visible from all 4 views and why is the view of this block the same for all views?
- Which other block is visible or partly visible from all views? Why?

**Expert Level:
Greyscale 2-7
Block viewing cards
(sets 1 - 6)**



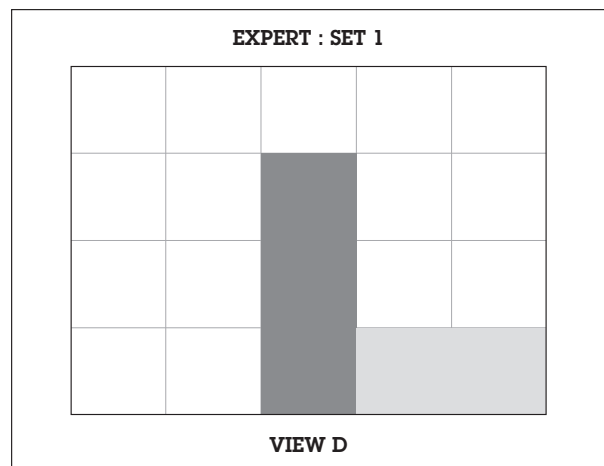
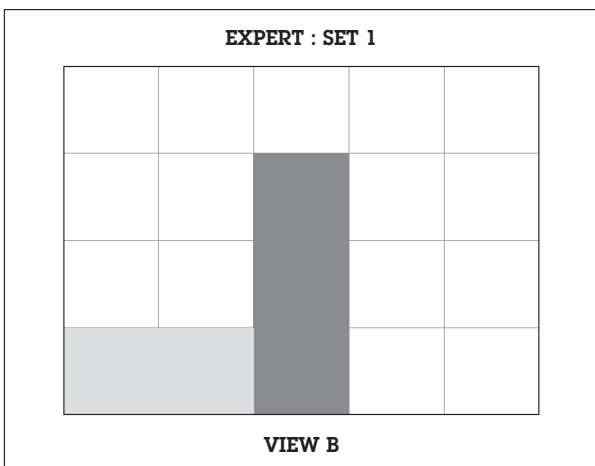
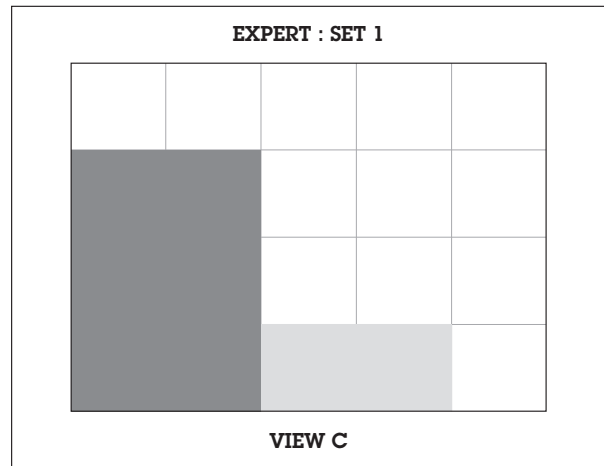
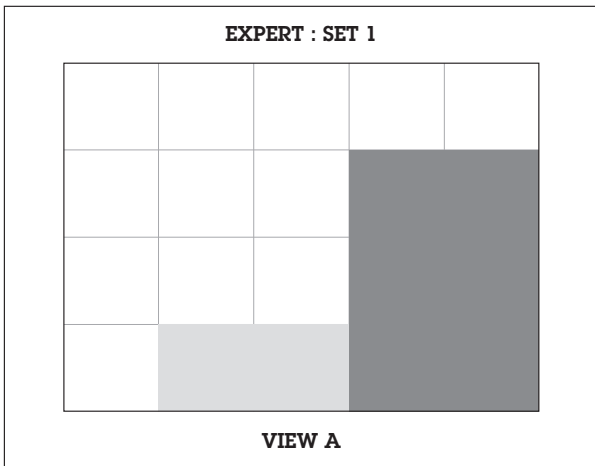
GRAYSCALE COLOUR CODE



NOTE

Although each colour block has an allocated grey scale, this is merely a guide. It should not interfere with the possibility of multiple solutions based on the shape seen and not on the grey allocated to a specific colour block.

EXPERT SET 1



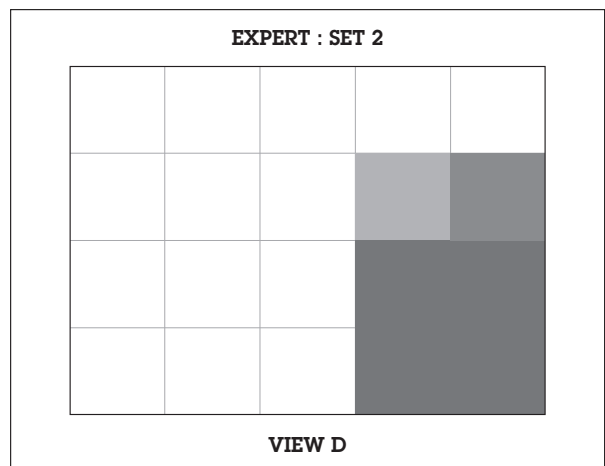
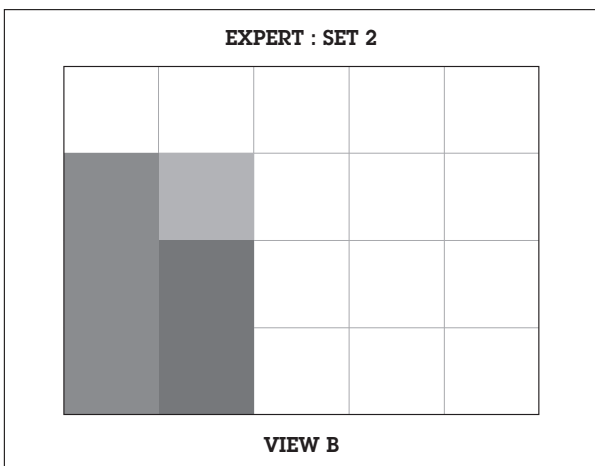
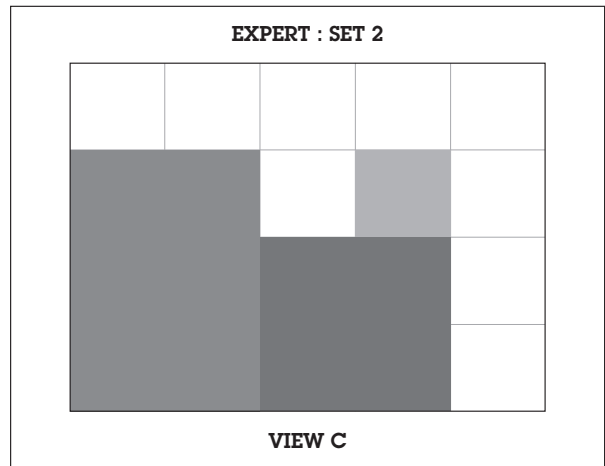
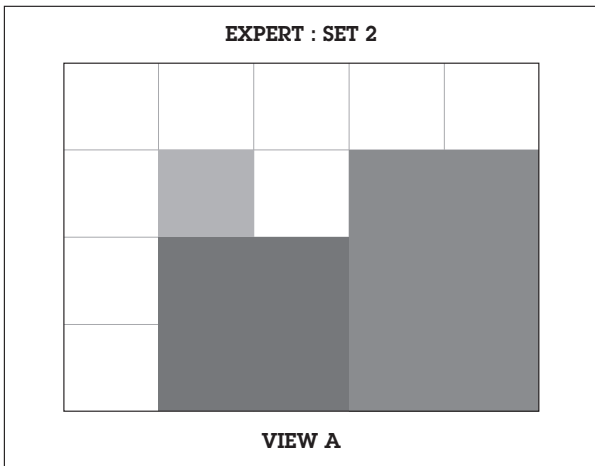
DISCUSSION

The view from opposite perspectives is the same. How did the absence of colour on the card sets influence your choice of blocks? Are there any other blocks that could have been used to create the same arrangement? Which shape in this card set is identifiable (even without colour)? Which shapes could have multiple solutions?

QUESTION

- How do you think the absence of colour will affect the arrangements as more blocks are added?
- Will it be easier or more difficult to select and place the blocks accurately for each view?

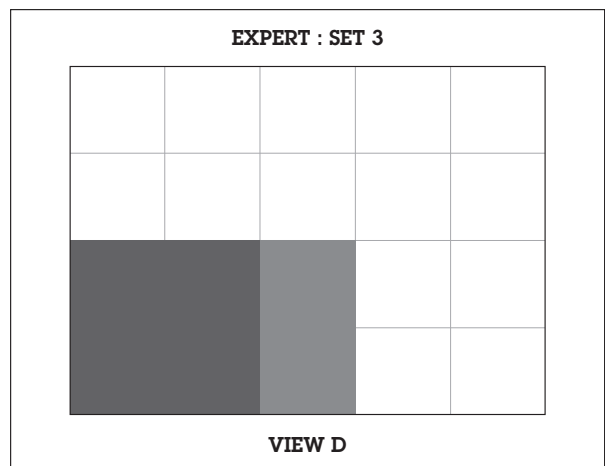
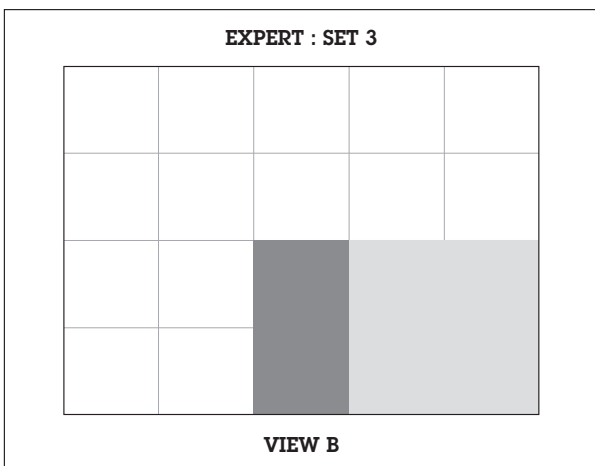
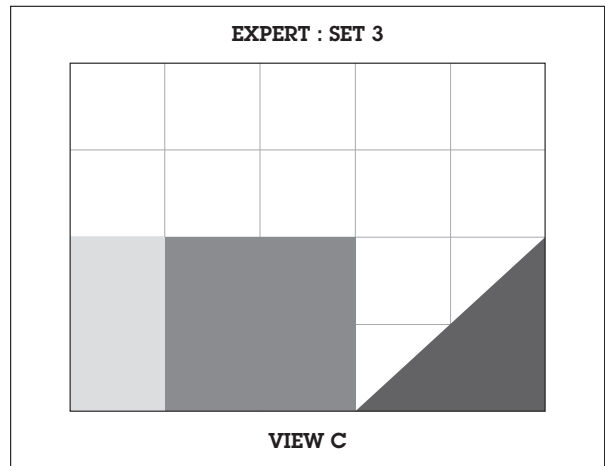
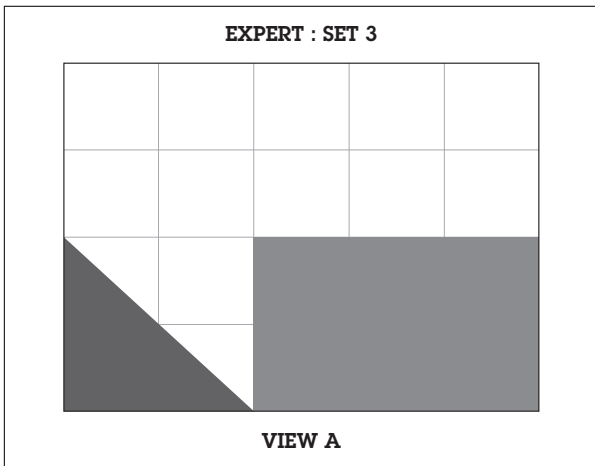
EXPERT SET 2



DISCUSSION

The view from opposite sides is the same. Was there any debate about which blocks to use? Are there any other block combinations that, due to the absence of colour, could have made this arrangement?

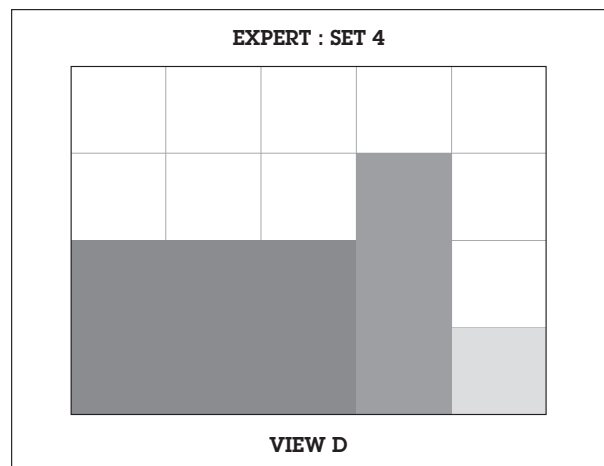
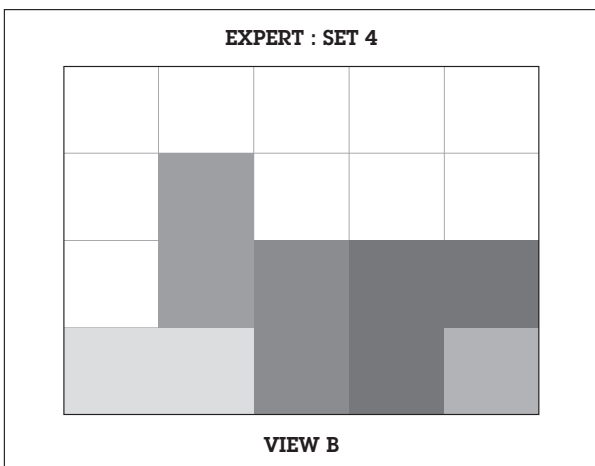
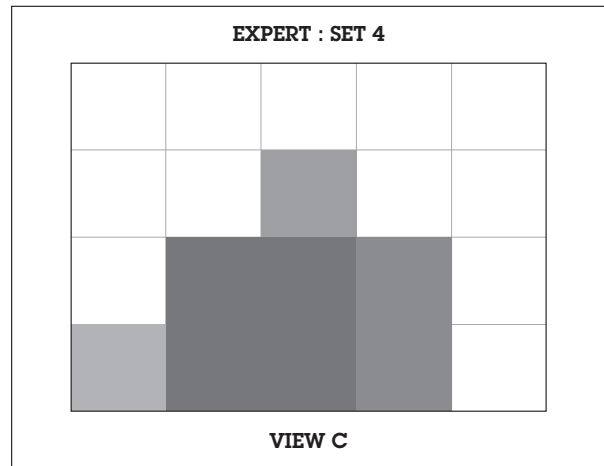
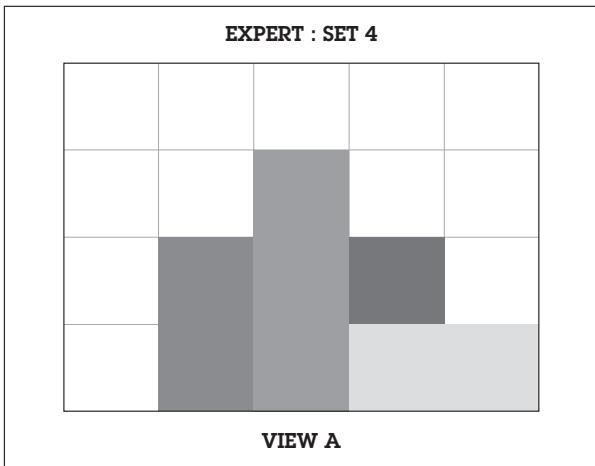
EXPERT SET 3



DISCUSSION

The view from all four perspectives is not the same. Depending on which player starts, and if there is a difference in interpretation in the greyscale to colour allocation, the purple block and blue triangular block (prism) could be in either position. So could the red and yellow. The yellow could also take the position of both the triangular block (prism) and purple block. But this interpretation is only true for certain views. It illustrates that there is more than one solution.

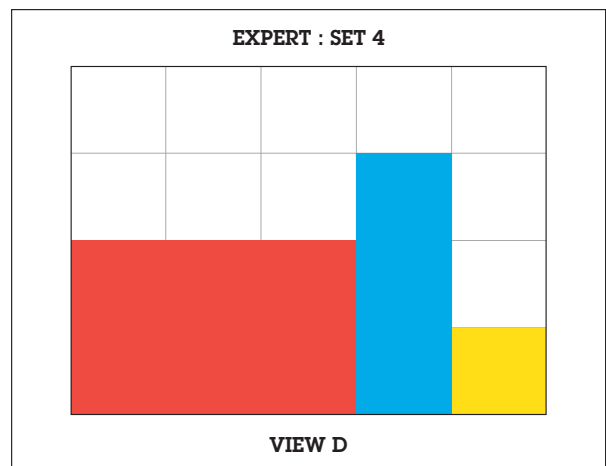
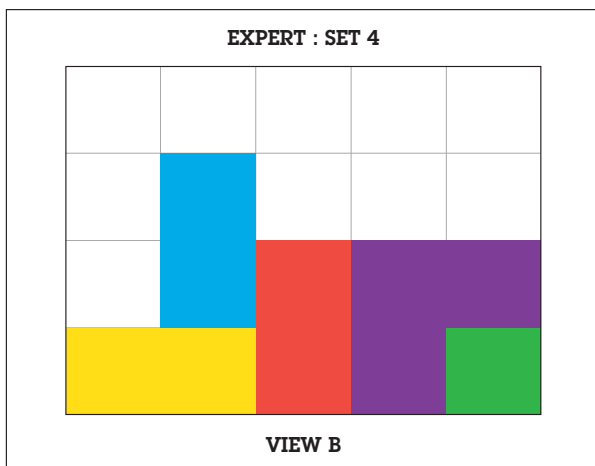
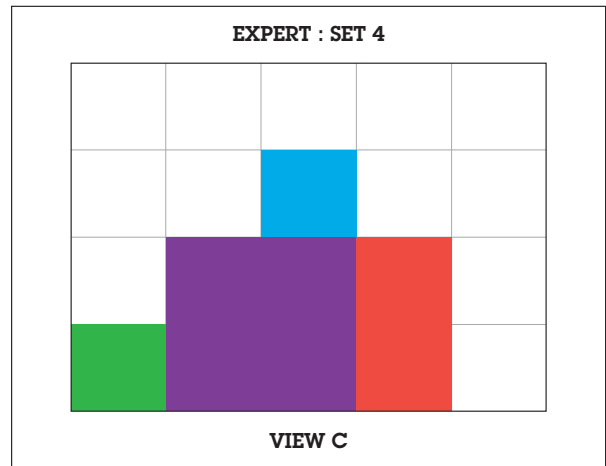
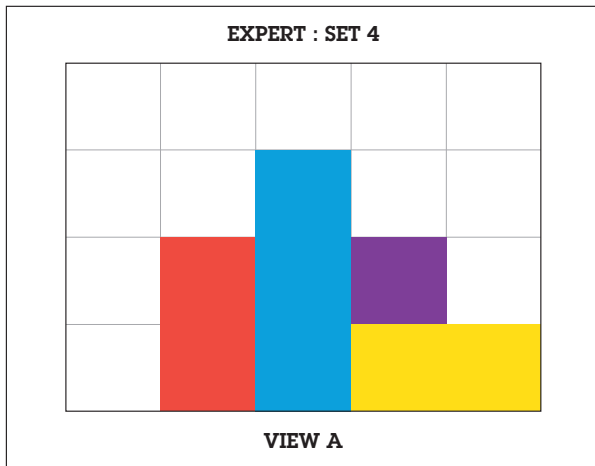
EXPERT SET 4



DISCUSSION

The view from all four perspectives is different. Is the selection of the correct blocks for all views becoming more difficult as the number of blocks in the arrangement increases? Was there any debate about which blocks to use? Were there any other combinations of blocks that worked for your view but not for the others? Discuss the challenges.

EXPERT SET 4 CHALLENGE EXPLORED



VIEW A

If there is a difference in interpretation in the greyscale to colour allocation, from this view the red and yellow could be in either position and the visible part of the purple could be seen as the green block stacked. The blue block could also be seen as the red one.

VIEW B

If there is a difference in interpretation in the greyscale to colour allocation, from this view the blue block could be seen as the red block; the green could be the blue; the purple could be the yellow and the red and yellow could be in either position.

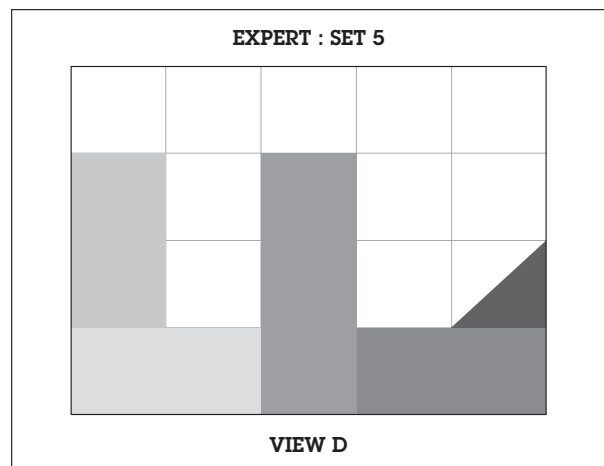
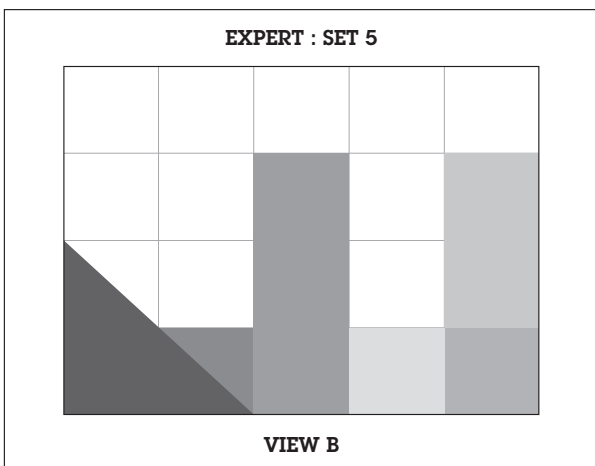
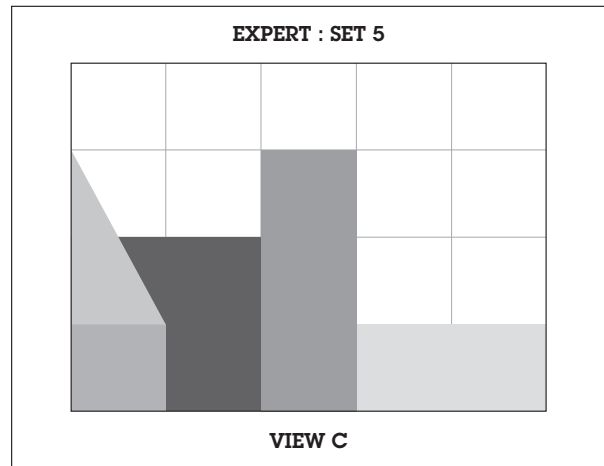
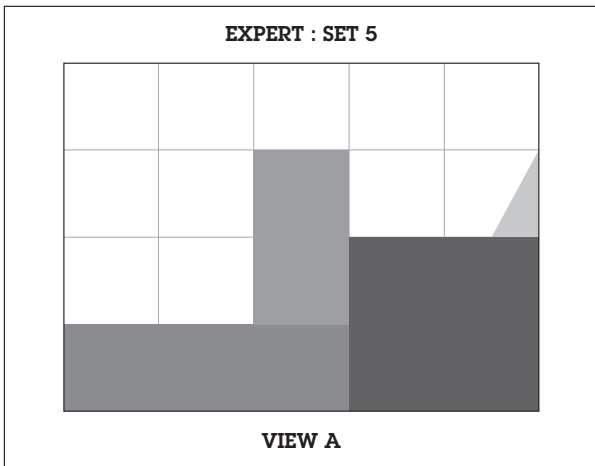
VIEW C

If there is a difference in interpretation in the greyscale to colour allocation, from this view the blue block could be the green block stacked, or the red block; green could be blue; the purple and red blocks could both be replaced by the yellow.

VIEW D

If there is a difference in interpretation in the greyscale to colour allocation, from this view the yellow block could also be the blue block and the blue block could be the red.

EXPERT SET 5



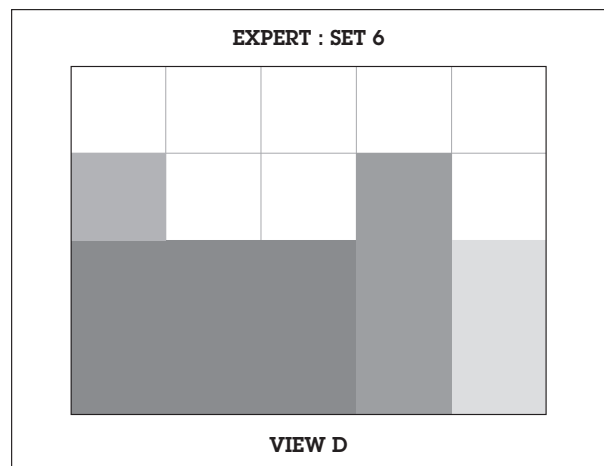
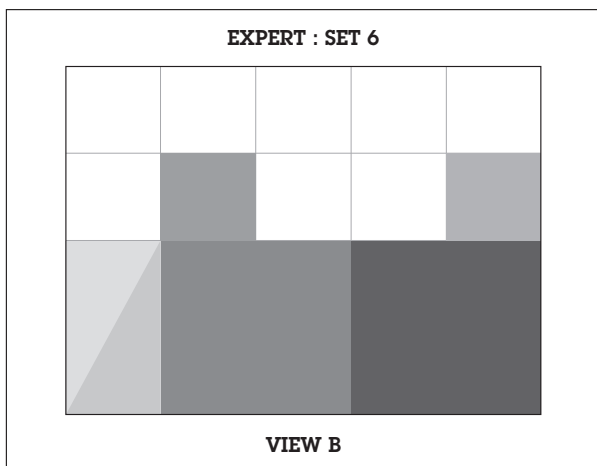
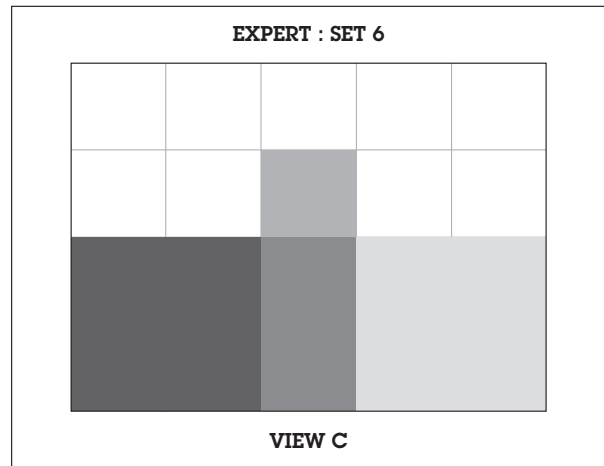
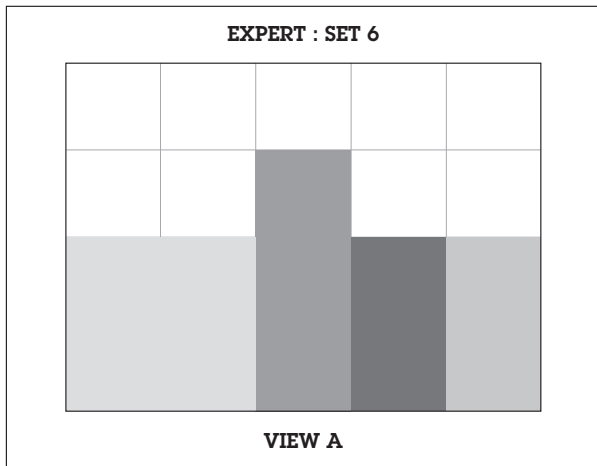
DISCUSSION

The view from all four perspectives is not the same. Discuss the difference between views A and C and views B and D. Continue the discussion generated by the previous set. Are there any other blocks that could generate the same view, in the absence of colour?

QUESTION

- Does including more blocks make the selection and placement easier or more difficult?

EXPERT SET 6



DISCUSSION

The view from all four perspectives is not the same. Continue the discussion generated by the previous two sets. Are there any other blocks that could generate the same view, in the absence of colour?

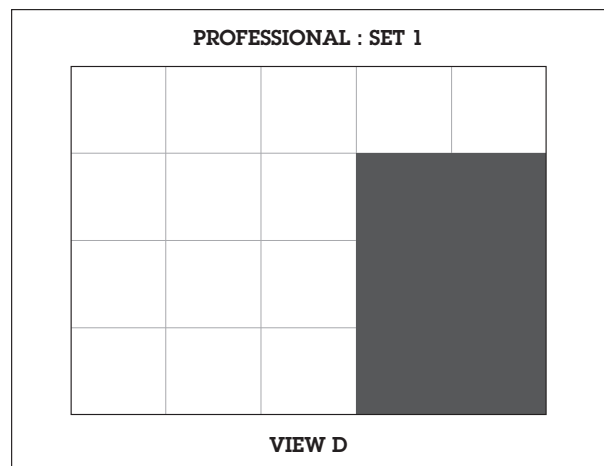
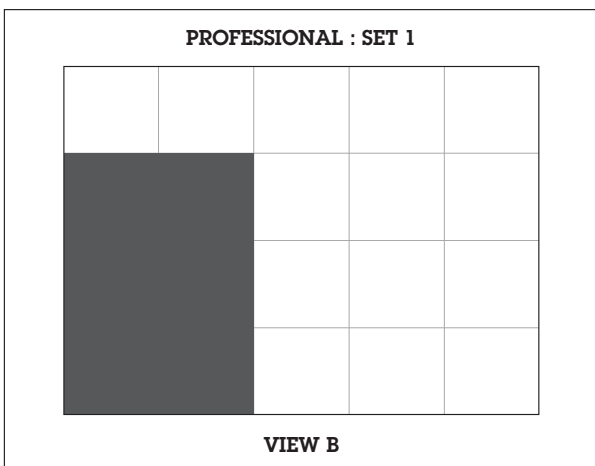
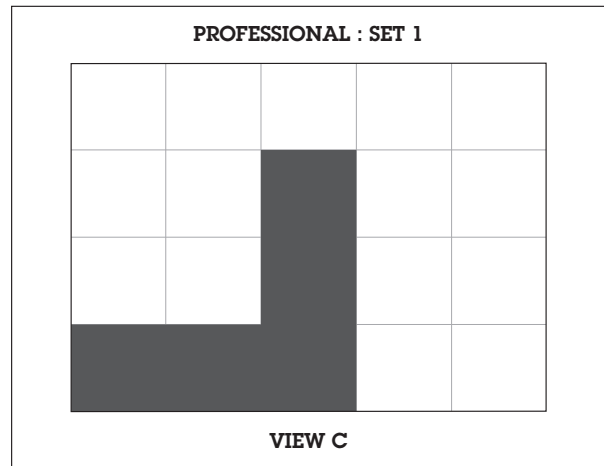
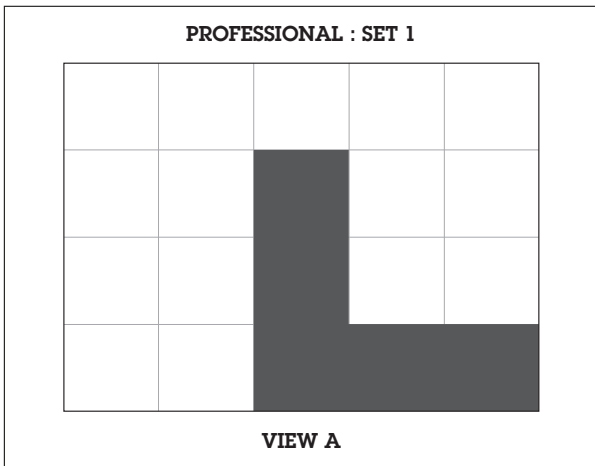
QUESTION

- Does including more blocks make the selection and placement easier or more difficult?

**Professional Level:
Silhouette 2-7
Block viewing cards
(sets 1 - 6)**



PROFESSIONAL SET 1



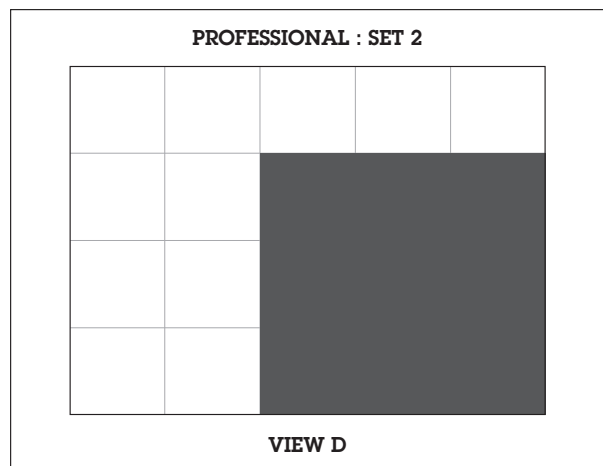
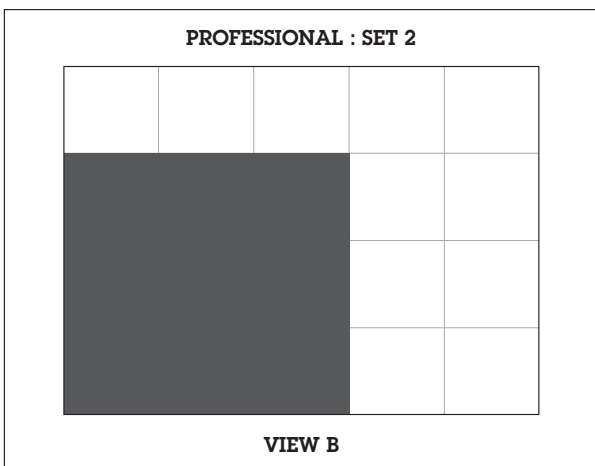
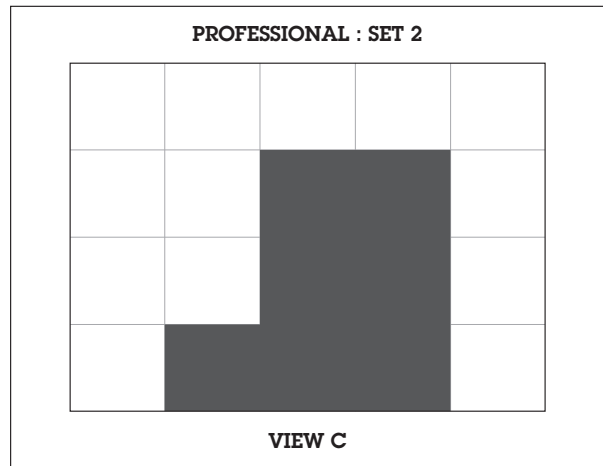
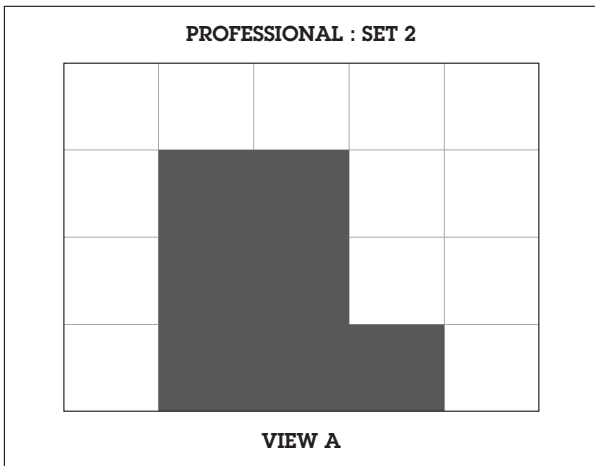
DISCUSSION

The view from opposite perspectives is the same. How many blocks did you use to achieve your solution? With the same blocks you have used to complete this arrangement, is there another way of placing them to achieve the same views from all 4 perspectives?

QUESTION

- Are there any other arrangements (using 2 blocks) that could have created this same view from your perspective?
- What do you think will happen when more blocks are added, hidden and stacked?

PROFESSIONAL SET 2



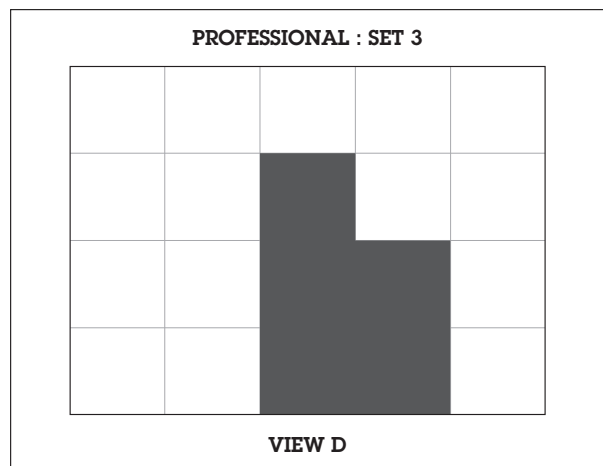
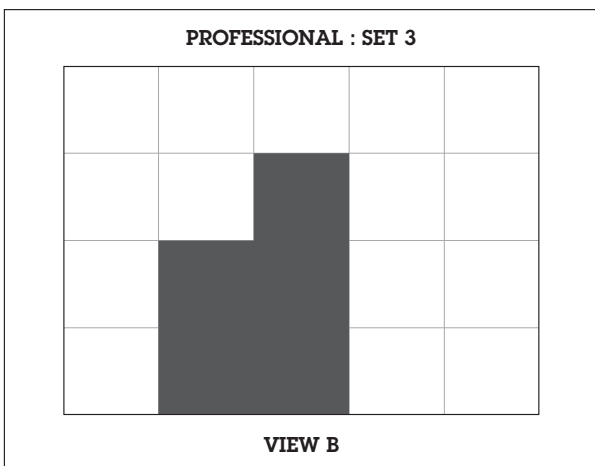
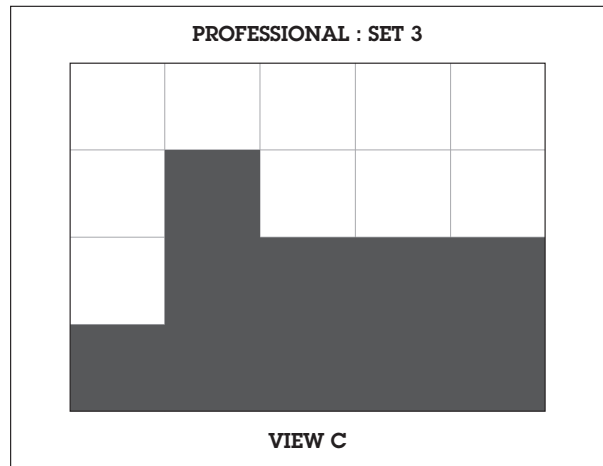
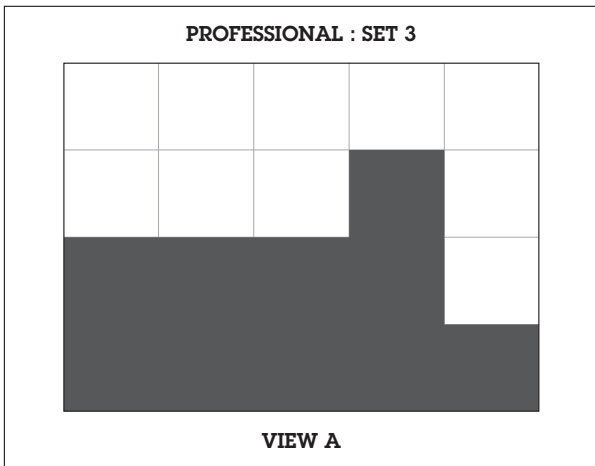
DISCUSSION

The view from opposite perspectives is the same.

QUESTION

- How many blocks did you use to achieve your solution?
- With the same blocks you have used to complete this arrangement, is there another way of placing them to achieve the same views from all 4 perspectives?
- Are there any other arrangements (using 3 blocks) that could have created this same view from your perspective?
- Why do you think there is possibly more than one solution for making this arrangement?

PROFESSIONAL SET 3



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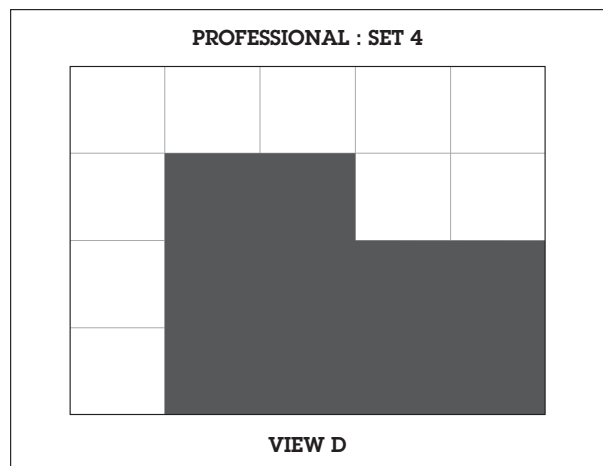
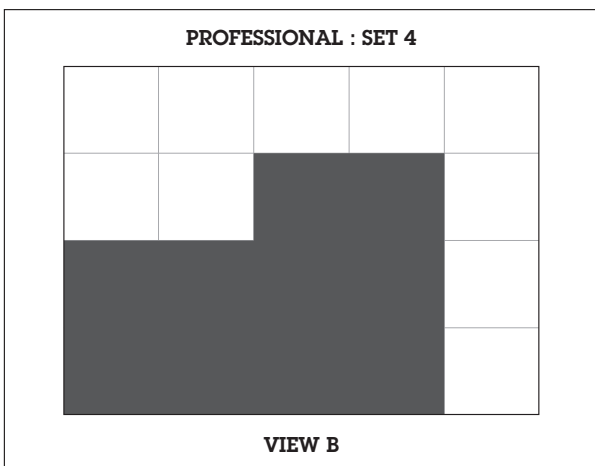
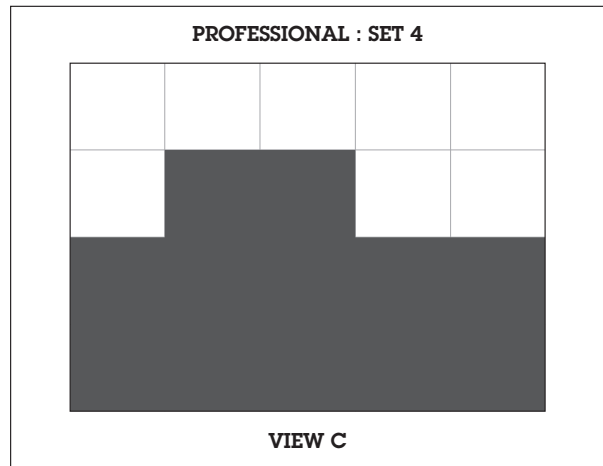
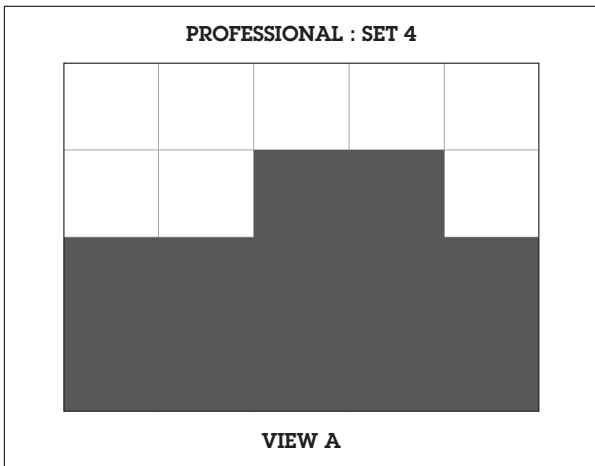
DISCUSSION

The view from opposite perspectives is the same.

QUESTION

- How many blocks did you use to achieve your solution?
- With the same blocks you have used to complete this arrangement, is there another way of placing them to achieve the same views from all 4 perspectives?
- Are there any other arrangements (using 4 blocks) that could have created this same view from your perspective?
- Take one of the triangular blocks (prism) and place it on the grid. Where would this need to be placed, from your view, for you to recognize it as triangular if you can only see the outline?

PROFESSIONAL SET 4



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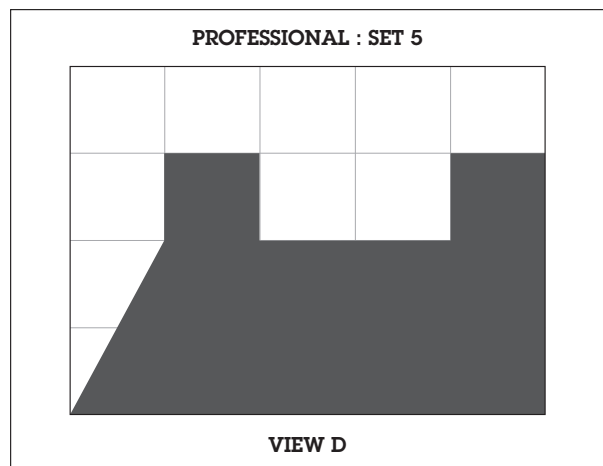
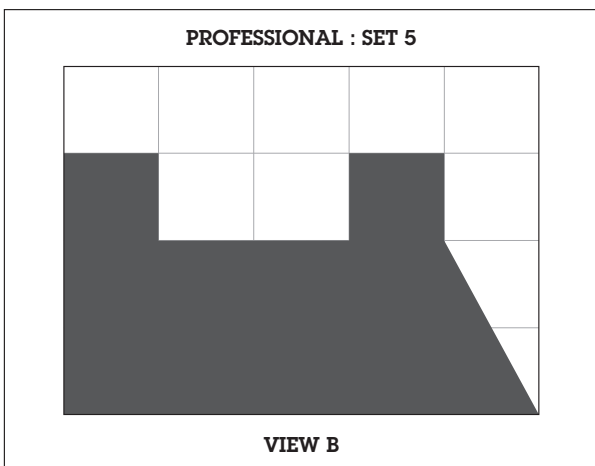
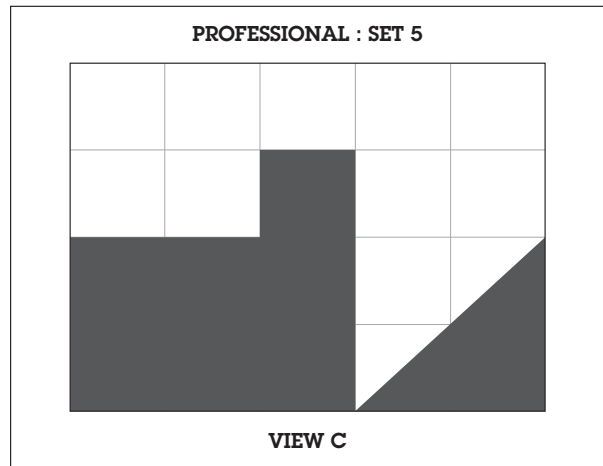
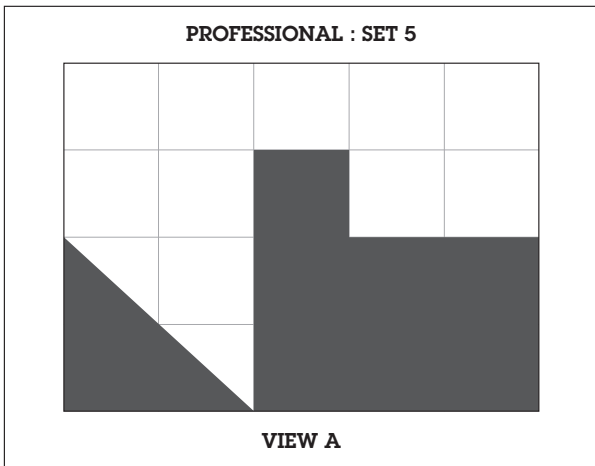
DISCUSSION

The view from opposite perspectives is the same.

QUESTION

- How many blocks did you use to achieve your solution?
- With the same blocks you have used to complete this arrangement, is there another way of placing them to achieve the same views from all 4 perspectives?
- Are there any other arrangements (using 5 blocks) that could have created this same view from your perspective?

PROFESSIONAL SET 5



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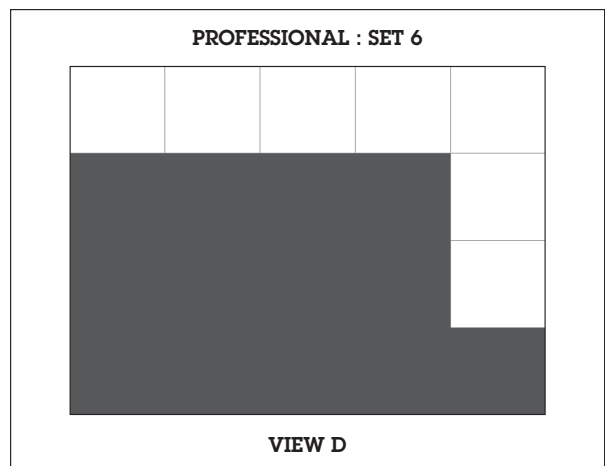
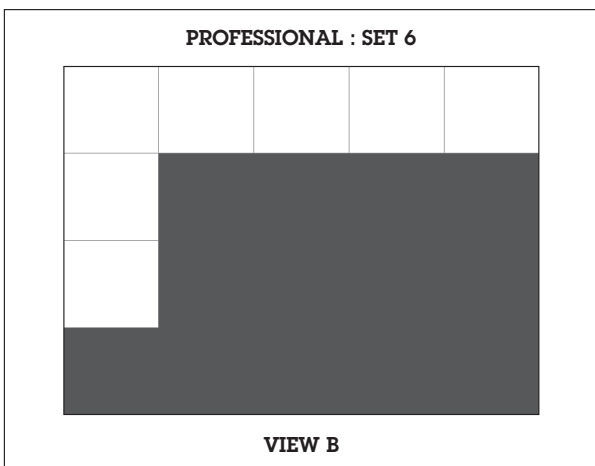
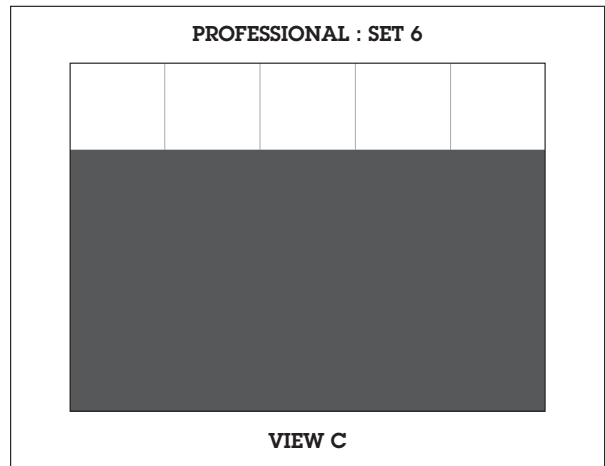
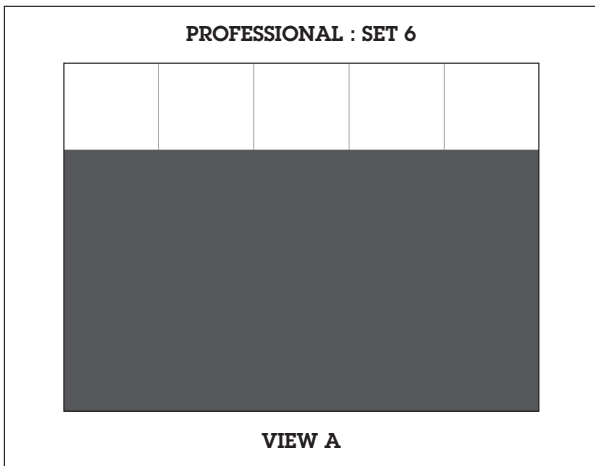
DISCUSSION

The view from opposite perspectives is the same.

QUESTION

- How many blocks did you use to achieve your solution?
- With the same blocks you have used to complete this arrangement, is there another way of placing them to achieve the same views from all 4 perspectives?
- Are there any other arrangements (using 6 blocks) that could have created this same view from your perspective?
- Does seeing the outline of the triangular blocks (prism) in this arrangement make it easier (or more difficult) to find another solution using a different selection of 6 blocks? Why?

PROFESSIONAL SET 6



DISCUSSION

The view from opposite perspectives is the same.

QUESTION

- How many blocks did you use to achieve your solution?
- With the same blocks you have used to complete this arrangement, is there another way of placing them to achieve the same views from all 4 perspectives?
- Are there any other arrangements (using 7 blocks) that could have created this same view from your perspective?
- Is it more challenging or a bit easier to arrange the blocks when using all 7?

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