IMPLEMENTING DIGITAL VISUALIZATION TECHNOLOGY WITHIN THE CONSTRUCTION EDUCATION: A PEDAGOGICAL INTERVENTION

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Background

- AEC industry continues to change due to computer-based technology
  - Smartphones
  - 3D printing
  - Mobile applications
  - Virtual Reality (VR)
  - Augmented Reality (AR)
  - Drones
  - Computer Software
- Causing a shift in AEC higher education

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Purpose of this research

The purpose of this research is to demonstrate the idea of using an intervention within the current AEC curriculum within higher education by using the latest technology.

The main objective is that this intervention will support the theory that digital visualization will help students be able to mentally use their spatial cognition more effectually in their field of study.

RESEARCH QUESTION

How will the pedagogical intervention with advanced digital visualization technology in the current AEC curriculum improve a student's spatial visualization?

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PURDUE SPATIAL VISUALIZATION TEST: ROTATIONS

The test consists of 30 unfamiliar objects that the end-user has to effectively understand the orientation of that object and figure out the result of that object after it has been rotated a number of times mentally.

PSVT:R Question Example

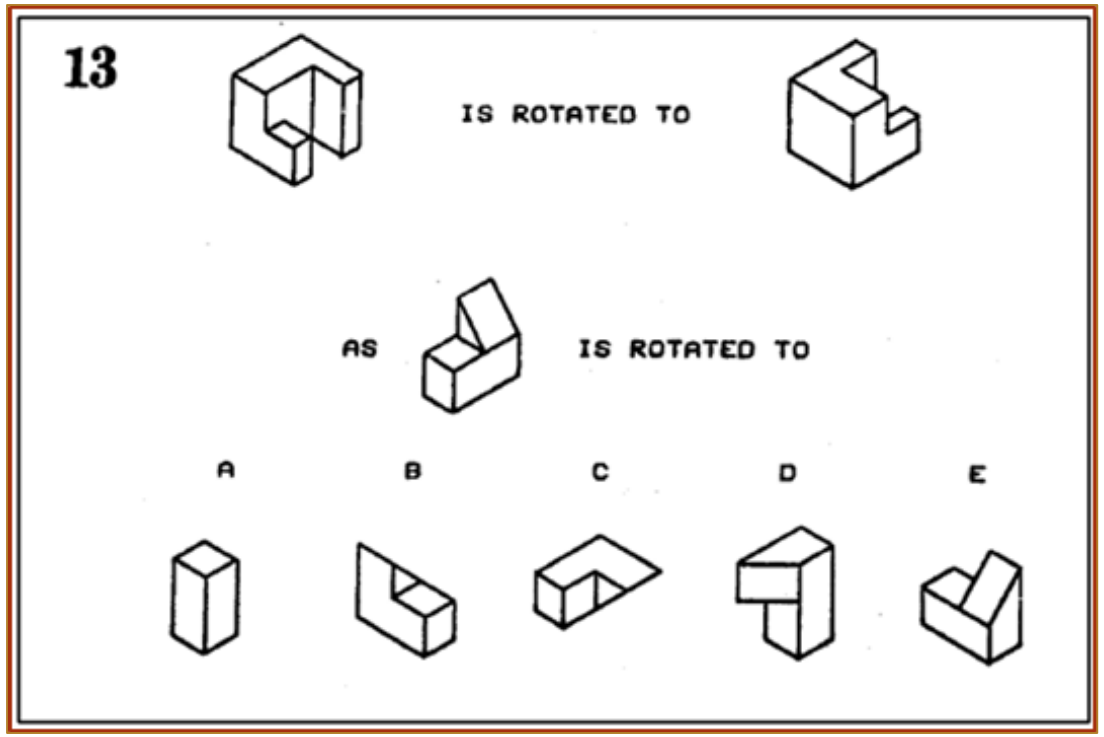

Image Source: Sorby and Barrmans, 2000

Case Study Results

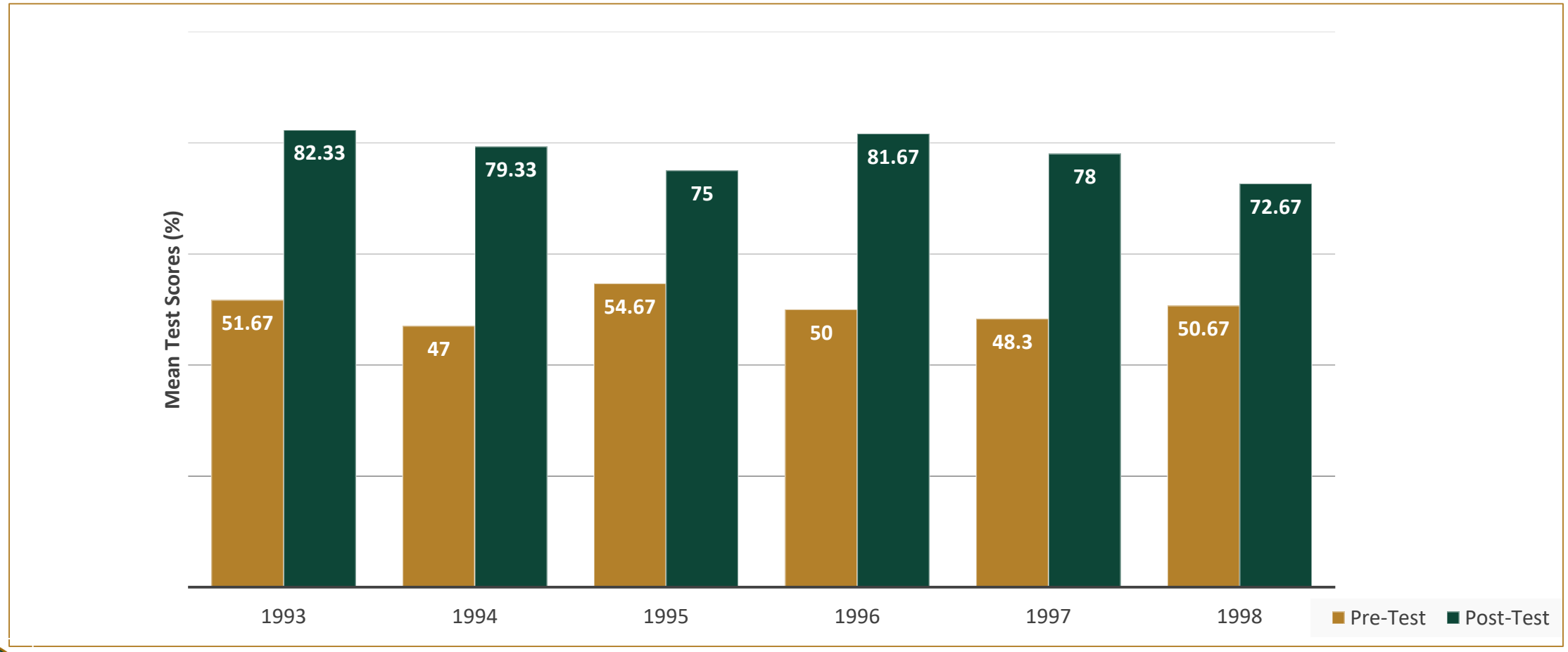

Image Source: Sorby and Barrmans, 2000

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Measuring a student's spatial cognition

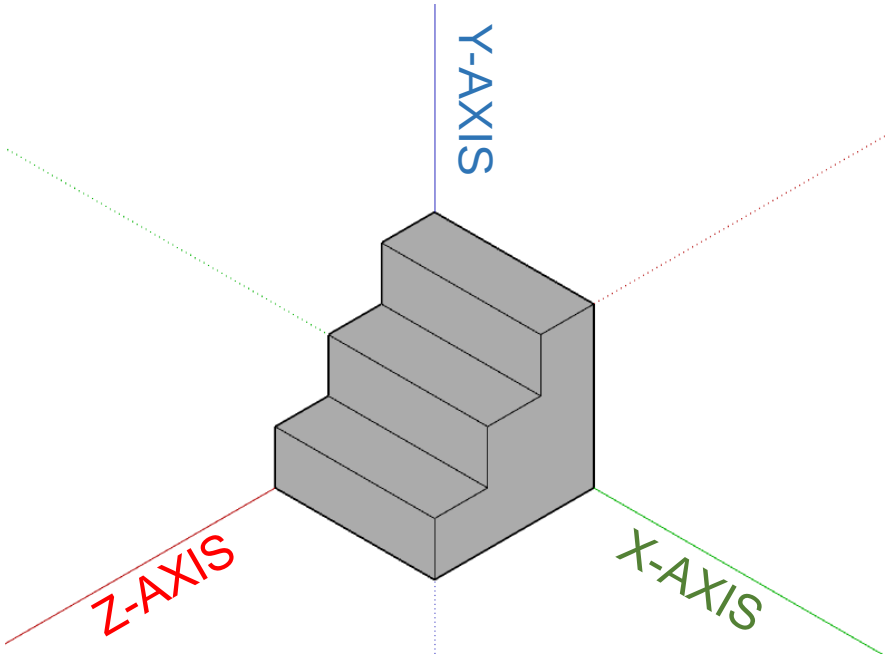
On the scale below, please indicate your level of confidence in your answer to this shape rotation question:

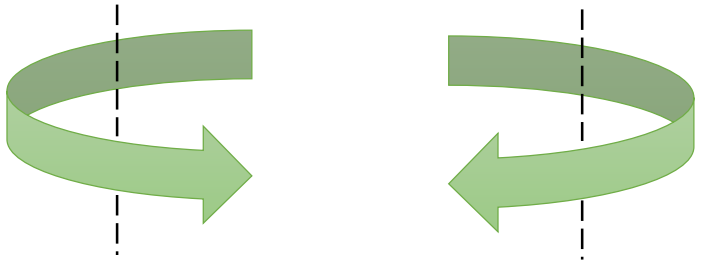
(1 = "Not Confident At All" and 10 = "Very Confident")

Not Confident At All — Very Confident

1 2 3 4 5 6 6 7 8 9 10

How confident are you in this answer?





POSITIVE

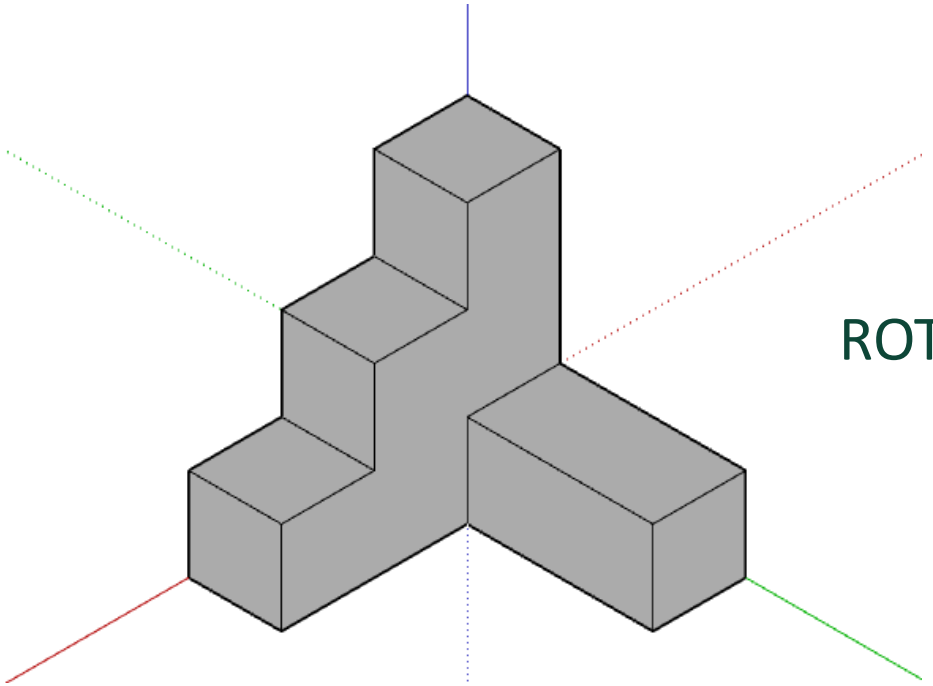
\+

COUNTER CLOCKWISE

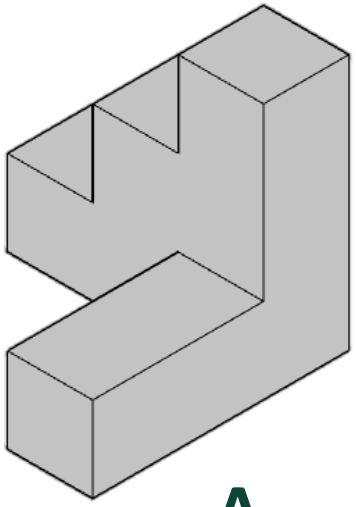
NEGATIVE

\-

CLOCKWISE



ROTATE OBJECT -270 ON Y-AXIS



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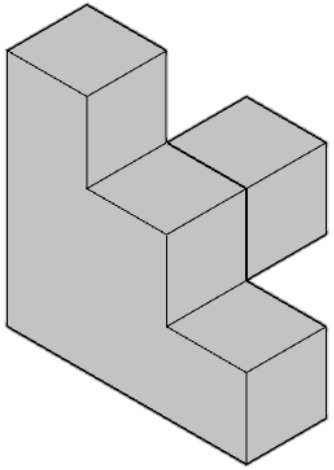

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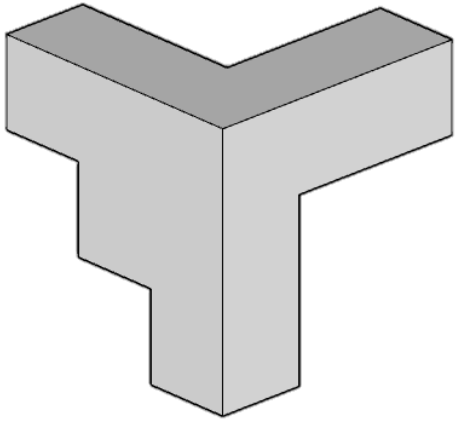

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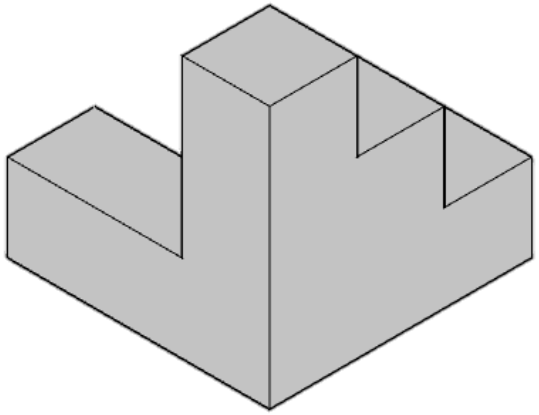

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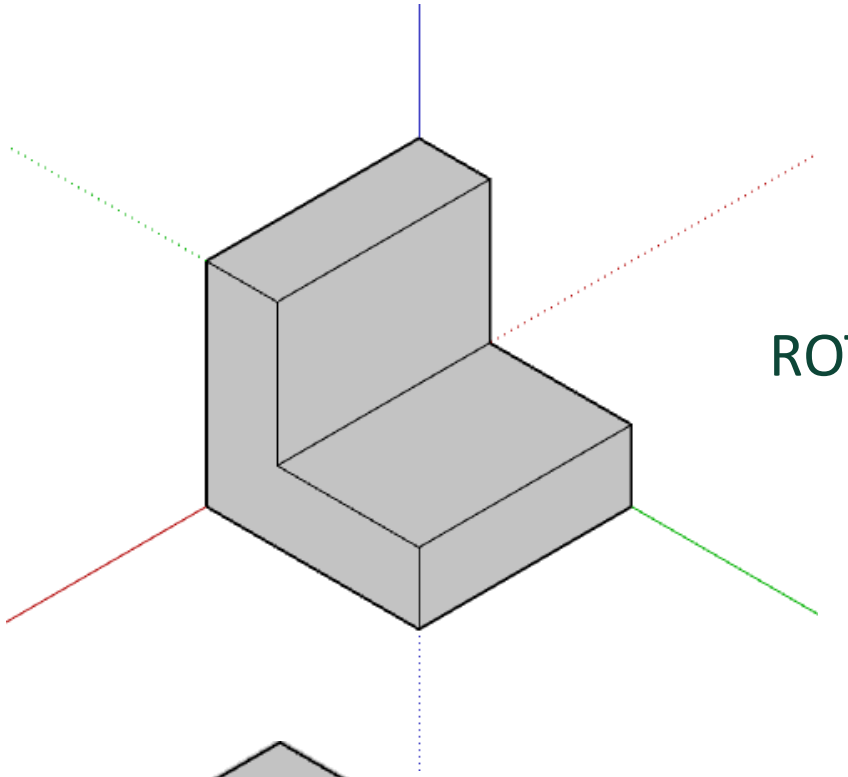
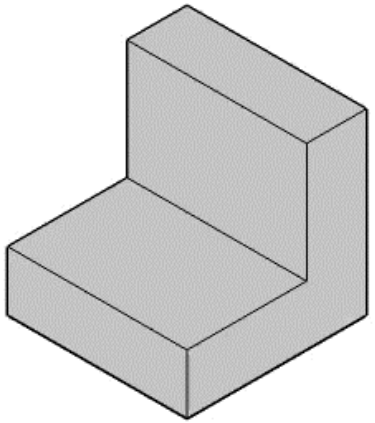
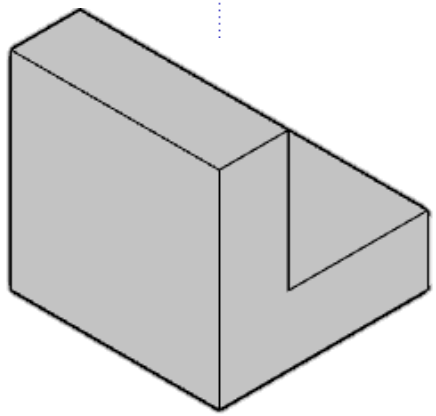


ROTATE OBJECT -90 ON Z-AXIS





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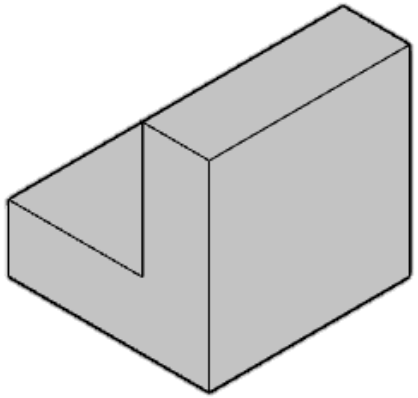

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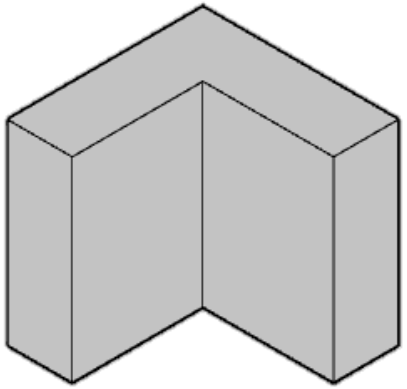

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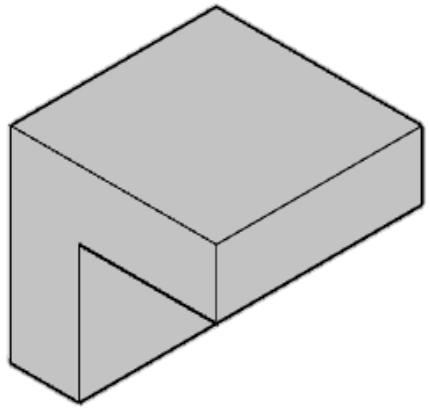

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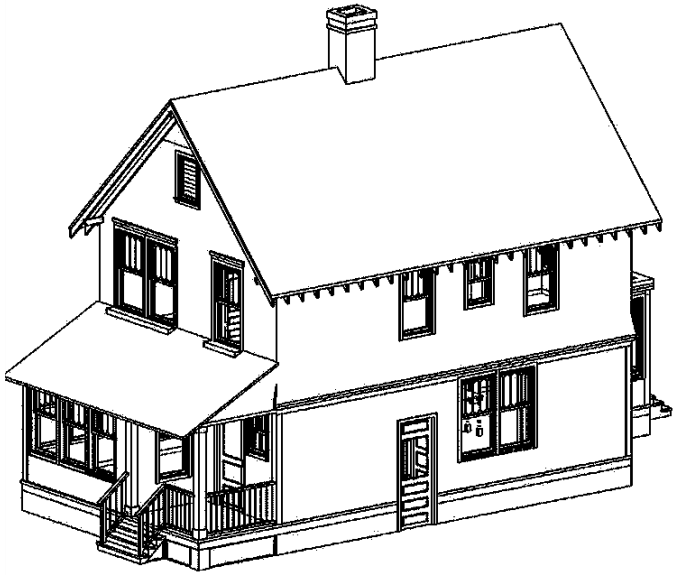
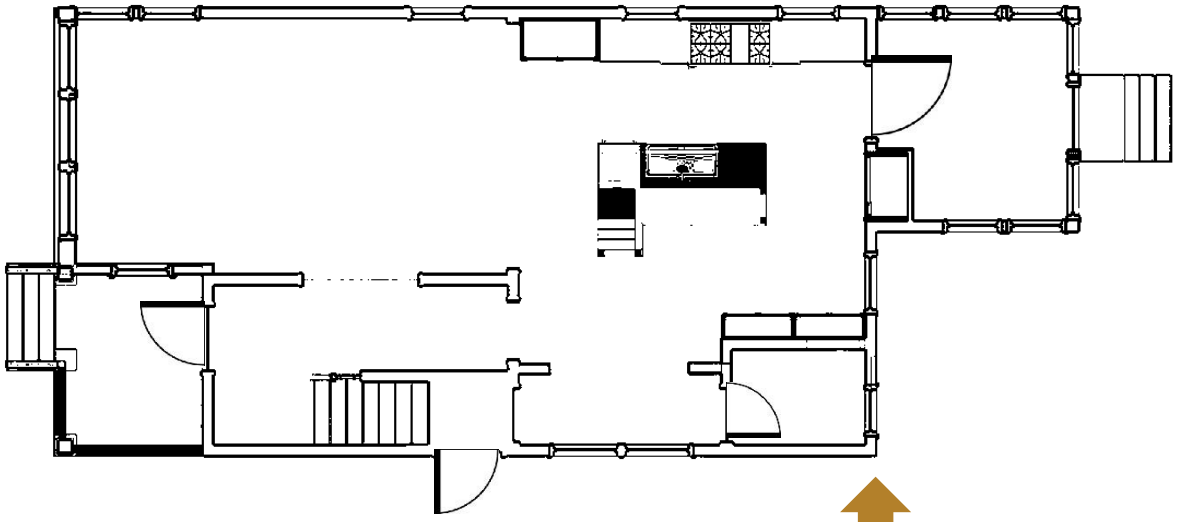


WHAT IS THE CORRECT NORTH ELEVATION?



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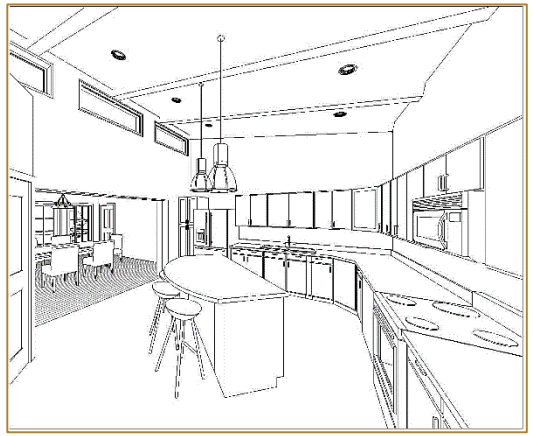
IF YOU WERE STANDING IN THE CIRCLE IN THE KITCHEN, WHAT PERSPECTIVE WOULD YOU SEE IN THE LIGHT GREEN SHADED AREA?



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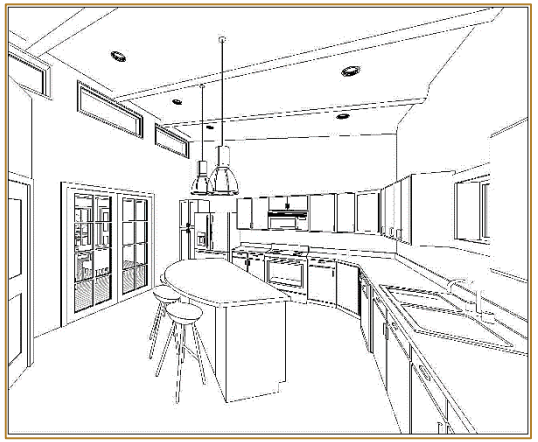

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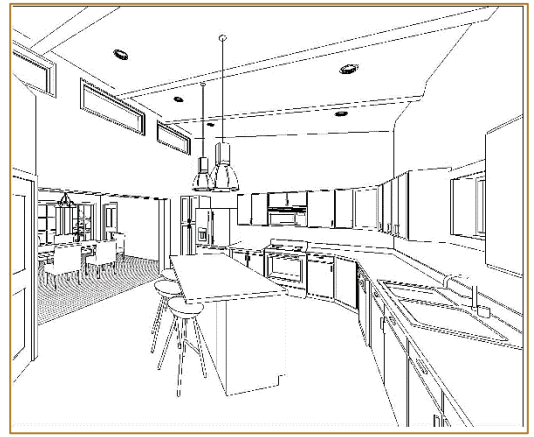

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What's Next?

Thank you