

DAYLIGHTING IN AN OPEN PLAN OFFICE SETTING

Existing program:

dimensions: approx. 25 feet x 32 feet, 800 sq feet.

ceiling height: approx. 11 feet tall.

single window: faces due south, 4 feet wide x 8 feet tall.

occupancy: desk space for 12 students.

working hours: approx. 10am - 6pm, year-round.

Your tasks for today's study:

1. **Analyze the available daylighting in the current room design.** Identify areas in the room that have too much or too little daylighting. Identify areas and times when glare from the sun might be problematic for students sitting at the desks trying to do computer work.
 - (a) First, using your intuition alone, consider how daylighting will affect this space.
 - (b) Next, build a scale model of this room in its current form using the virtual heliodon and analyze the available daylighting, testing your hypotheses.
2. **Suggest renovations to the room to improve the use of daylighting.** Make these edits to the design using the virtual heliodon and re-analyze the available daylighting in the new space.
3. **Create and analyze a completely new design for the same program.** Your new design should provide working space for 12 students with roughly the same square footage, but it can be located in a different building on campus, have a different orientation with respect to the sun, etc. Use the virtual heliodon to sketch and analyze your new design.

After each exercise you will be asked to complete a few short written questions.

PART 1: INTUITION OF EXISTING DESIGN

Participant ID _____

Identify *areas of the room, times of the day, and days of the year* that will have: (A) too much illumination from daylighting, (B) too little illumination from daylighting, and (C) the potential for glare from the sun. Make a quick sketch of the existing room and annotate this sketch with your predictions.

Based on your intuition, estimate the percentage of normal working hours throughout the year that the desks receive sufficient illumination from the sun and sky alone (no electric lighting) to perform typical office work. (Daylight Factor/Daylight Autonomy)

Describe the available daylighting and use of electric lighting within the room during your visit. How did the current condition affect your impression of the space?

**PART 2: ANALYSIS OF EXISTING DESIGN
WITH VIRTUAL HELIODON**

Participant ID _____

What time and day simulations or timelapse animations did you request for analysis?
What was your strategy in selecting these moments or periods?

Did you understand the resulting simulation display? What was confusing or unclear in the simulation?

Based on your analysis with the new tool, what is your new estimate of the Daylight Factor/Daylight Autonomy? Explain any difference in your previous estimate.

What new insights did you gain about daylighting within this space? Were any of the simulation results unexpected?

PART 3: ANALYSIS OF A PROPOSED RENOVATION

Participant ID _____

Describe your proposed renovation. What was your strategy to improve the use of daylighting within the space?

What time and day simulations or timelapse animations did you request for analysis?
Did the proposed renovation perform as expected?

What is your estimate of the Daylight Factor/Daylight Autonomy of the new space?

On a scale from 1 (poor) to 5 (excellent), rate the effectiveness of this new tool for:

- 1 2 3 4 5 Evaluating the quantity of illumination (too much or too little)
- 1 2 3 4 5 Determining the potential for glare at different locations and time periods
- 1 2 3 4 5 Understanding the interesting and dynamic qualities of daylighting
- 1 2 3 4 5 Use in architectural education for daylighting study and analysis

PART 4: ANALYSIS OF A NEW DESIGN

Participant ID _____

Describe your new design and the motivations behind this design.

Were you able to build a satisfactory model of the design? If not, what aspects of your new design that are important for daylighting simulation and analysis were you unable to model?

What is your estimate of the Daylight Factor/Daylight Autonomy of the new space?
Overall how did the new design perform and how satisfied are you with these results?

Additional Feedback: Please describe your suggestions for how we can improve the effectiveness of this tool for daylighting analysis.