

# Thirty-Minute CAD Sprint

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| <b>Difficulty</b><br>Intermediate | <b>Time</b><br>30 minutes plus review | <b>Type</b><br>Competition |
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## Background

Rapid CAD work is useful when engineers need a concept model for a meeting or prototype decision.

## Engineering Problem

Model a randomly assigned object accurately within 30 minutes, then evaluate which modeling choices improved speed and quality.

## Learning Objectives

- Plan an efficient feature sequence
- Use constraints and parameters quickly
- Prioritize critical geometry
- Review CAD quality under time pressure

## Materials

- Fusion 360
- One approved object or dimension card
- Calipers or ruler
- Timer
- Engineering notebook

## Procedure

1. Draw or receive an object such as a LEGO-style brick, die, battery spacer, USB shell, or simple bracket.
2. Spend three minutes identifying the base feature, repeated features, symmetry, and likely parameters.
3. Record a short modeling plan before opening a sketch.
4. Model for 25 minutes.
5. Use the final two minutes to rename features, check constraints, and inspect dimensions.
6. Export one screenshot showing the browser and completed model.
7. Compare the model with the object or dimension card.
8. Record one shortcut that helped and one rushed decision that caused rework.

## Engineering Requirements

- Use at least one named parameter
- Keep all major sketches fully constrained
- Include every critical feature
- Use patterns or symmetry where appropriate
- Finish within 30 minutes

## Constraints & Safety

- No imported models
- No help from another student during the timed period
- Accuracy is more important than decorative details
- Object must be instructor-approved

## Deliverables

- Modeling plan
- Fusion file
- Final screenshot
- Accuracy checklist
- Short time-management reflection

## Reflection Questions

1. Which feature should have been created first?
2. Where did you lose the most time?
3. Did a pattern or parameter improve speed?
4. What would you change in a second attempt?

### Engineering Tip

Spend a few minutes planning. A strong feature order saves more time than sketching immediately.

### Common Mistake

Fast modeling is not the same as careless modeling. Unconstrained sketches create hidden problems later.

## Stretch Goal

Remodel the same object in 20 minutes using lessons from the first attempt.

## Career Connection

CAD designers frequently create rapid concept models before detailed engineering work begins.