

WRITING EACH SECTION OF A TECHNICAL REPORT

What, How, and Warnings for Every Part

Report Sections: What We'll Cover

FRONT MATTER

- Title Page
- Abstract

INTRODUCTION

- Why this topic
- What you'll do

MAIN CHAPTERS

- Literature Review
- Methodology
- Results
- Discussion

CONCLUSIONS

- What you found
- Why it matters

REFERENCES

- All sources cited

TITLE PAGE - What & How

WHAT Goes On Title Page?

WHAT to include:

- University logo (centered)
- Full report title (CAPITALS)
- Supervisor with full title
- All student names + IDs
- City and DATE (DD.MM.YYYY)

Example from student report:

REQUIREMENTS FOR FIRE

RESISTANT STRUCTURES

Supervisor

Assoc. Prof. Dr. Tolga GÖĞÜŞ

HOW To Format It?

HOW to prepare:

- ✓ Center everything horizontally
- ✓ Space items vertically balanced
- ✓ Logo at top (2-3 inches)
- ✓ Title largest text (18-20pt)
- ✓ Supervisor/Names 12pt
- ✓ NO page number on title page
- ✓ Professional, clean look

⚠ Common mistakes:

- ✗ Logo too small
- ✗ Crowded layout
- ✗ Wrong date format
- ✗ Missing student IDs
- ✗ Informal language in title

ABSTRACT - What & How

WHAT Content Goes Here?

WHAT to write (200-300 words):

Para 1: THE PROBLEM

- Why is topic important?
- What problem does it solve?

Example: 'Fires can cause severe damage to buildings due to high temperatures, leading to loss of structural integrity...'

Para 2: YOUR ANALYSIS

- What did you study/analyze?
- What methods did you use?

Para 3: FINDINGS & PURPOSE

- What did you find?
- Why does it matter?

HOW To Write It?

HOW to write:

- ✓ ONE paragraph, tightly written
- ✓ Past tense: 'was analyzed'
- ✓ Active voice: 'this study shows'
- ✓ No citations or references
- ✓ Complete sentences only
- ✓ Dense but clear
- ✓ Read it 3x for clarity

KEY WORDS: 5-6 terms

fire resistance, materials,
structural design, safety standards

⚠ Common mistakes:

- ✗ Too long (>350 words)
- ✗ Vague conclusions
- ✗ Missing key info
- ✗ Too many citations

INTRODUCTION - What & How

WHAT Sections Belong Here?

WHAT to write (5-10 pages):

1.1 CONTEXT & BACKGROUND

- Historical importance
- Current relevance

Example: 'Fires have been one of the most destructive types of disasters for human settlements'

1.2 PROBLEM STATEMENT

- What gap exists?
- Why does it matter?

1.3 RESEARCH OBJECTIVES

- Clear, specific goals
- What will you examine?

1.4 REPORT ORGANIZATION

- Roadmap: 'Chapter 2 covers...'
- Helps reader navigate

HOW To Make It Flow?

HOW to structure:

- ✓ GENERAL → SPECIFIC flow
- ✓ Tell reader 'why should I care?'
- ✓ Motivate the problem clearly
- ✓ Show gap in knowledge

✓ Preview what's coming

WRITING TIPS:

- ✓ Use real examples (Grenfell Tower)
- ✓ Statistics: 'fires cause X deaths'
- ✓ Connect to civil engineering
- ✓ End with clear questions

⚠ Common mistakes:

- ✗ Too long introduction
- ✗ Unclear 'why this matters'
- ✗ No clear objectives
- ✗ Jumps to technical details

LITERATURE REVIEW - What & How

WHAT Existing Work Is Relevant?

WHAT to write (5-8 pages):

ORGANIZE BY THEME, NOT AUTHOR:

Theme 1: FIRE RESISTANCE

- Concrete behavior in fire
- Steel protection requirements
- [1] Author1, [2] Author2

Theme 2: STRUCTURAL MATERIALS

- Wood vs concrete vs steel
- Fire classifications
- [3] Author3, [4] Author4

Theme 3: FIRE SAFETY SYSTEMS

- Passive protection (walls, doors)
- Active systems (sprinklers)

END: Compare approaches, identify
what YOUR report adds

HOW To Organize & Review It?

HOW to review literature:

- ✓ READ: 2-3 reliable sources per topic
- ✓ UNDERSTAND: What did they find?
- ✓ ORGANIZE: By THEME, not author
- ✓ SYNTHESIZE: Compare approaches
- ✓ CITE: Every factual claim [#]

SOURCE QUALITY:

- ✓ Peer-reviewed journals
- ✓ Published textbooks
- ✓ Technical reports
- ✗ Wikipedia, blogs (not good)

⚠ Common mistakes:

- ✗ Listing papers without connecting
- ✗ Only 1 source per topic
- ✗ Summarizing, not synthesizing
- ✗ Missing citations

METHODOLOGY - What & How

WHAT Methods Did You Use?

WHAT to write (5-10 pages):

PURPOSE:

'This chapter describes the methods used to investigate [your question]'

SECTIONS:

3.1 RESEARCH APPROACH

- Theoretical analysis vs experimental testing?
- Literature review vs case study?

3.2 MATERIALS/DATA SOURCES

- What materials analyzed?
- Standards used?
- Example: 'Analysis based on TS EN 1991-1-2 fire loading standards'

3.3 ANALYSIS METHOD

- Step-by-step procedure
- Calculations or simulations used?
- Software (SAP2000, ETABS)?

HOW To Describe Them Clearly?

HOW to describe methods:

- ✓ PAST TENSE: 'was analyzed', 'were measured'
- ✓ PASSIVE VOICE: 'The model was created using...' is OK here
- ✓ SPECIFIC & REPEATABLE: Reader could follow your steps
- ✓ REFERENCE standards: 'TS EN 1991'

DETAIL LEVEL:

- ✓ Every step documented
- ✓ Equations: Use numbering (Eq. 3.1)
- ✓ Diagrams: Flowchart of process
- ✓ Why each choice? (not just what)

⚠ Common mistakes:

- ✗ Too brief: 'We did analysis'
- ✗ Vague: 'Standard procedures used'
- ✗ No equation numbers
- ✗ Reader can't replicate work

RESULTS - What & How

WHAT Data Did You Collect?

WHAT to present (5-10 pages):

PURE FINDINGS - NO INTERPRETATION:

Present:

- ✓ Data tables
- ✓ Graphs & charts
- ✓ Calculations
- ✓ Test results

Example from student report:

Table 1.1 Major Fire Incidents

Event | Year | Location | Deaths | Cause

Grenfell | 2017 | London | 72 | Faulty

Izmir | 2020 | Turkey | 0 | Extreme

Graph 1.1 Main Causes of Death

Smoke Poisoning: 60%

Evacuation Delay: 20%

Structural Collapse: 10%

HOW To Present It Clearly?

HOW to present results:

TABLES:

- ✓ Present detailed numbers
- ✓ Easy comparison
- ✓ Title ABOVE table
- ✓ Source noted BELOW

FIGURES/GRAPHS:

- ✓ Show trends & relationships
- ✓ Large enough to read
- ✓ Clear axis labels
- ✓ Title/caption BELOW figure
- ✓ Reference in text: 'Figure 3.2 shows that...'

WRITING:

- ✓ Just STATE findings: 'Results show that concrete resists...'
- ✓ Present, don't interpret yet
- ✓ Reference every table/figure

⚠ Common mistakes:

- ✗ Interpreting here (do in Discussion)
- ✗ Table without caption
- ✗ Unreadable figures
- ✗ Results not referenced in text

DISCUSSION - What & How

WHAT Do Results MEAN?

WHAT to write (5-10 pages):

NOW INTERPRET YOUR RESULTS:

5.1 WHAT DO RESULTS MEAN?

- Relate back to literature
- Compare with others' findings

Example: 'Results support previous studies showing concrete maintains integrity at ~500-600°C'

5.2 WHY DID YOU GET THESE?

- Explain physical mechanisms
- Connect to theory

5.3 IMPLICATIONS

- What's the bigger picture?
- Design recommendations?

5.4 LIMITATIONS

- What didn't you study?
- Acknowledge gaps

HOW To Analyze & Discuss?

HOW to discuss meaningfully:

✓ PRESENT TENSE NOW:

'Results indicate that...'

'This suggests that...'

✓ REFERENCE both:

- Your results (Figure 3.2)

- Literature [5], [6]

✓ LOGICAL FLOW:

One finding → Why → Meaning

STRUCTURE:

✓ Break into subsections (5.1, 5.2)

✓ Discuss most important results

✓ Acknowledge unexpected findings

✓ Compare to literature

✓ Discuss design implications

⚠ Common mistakes:

✗ Just repeating results

✗ Speculating without evidence

✗ Ignoring contradictions

✗ Forgetting literature comparison

CONCLUSIONS - What & How

WHAT Have You Concluded?

WHAT to write (1-2 pages):

ANSWER YOUR QUESTIONS:

From Introduction, you asked:

'What materials provide best fire resistance in building design?'

CONCLUSION should answer:

'Based on analysis, concrete provides superior fire resistance compared to unprotected steel, while engineered timber offers a sustainable alternative.'

6.2 SIGNIFICANCE

- Why do your findings matter?
- Impact on engineering practice?

6.3 RECOMMENDATIONS

- What should engineers do?
- Future research?

HOW To Wrap Up Powerfully?

HOW to conclude effectively:

- ✓ SUMMARIZE, don't repeat
- ✓ 1-2 sentence per key finding
- ✓ CONNECT to real world
- ✓ Practical implications

STRUCTURE:

Opening: Restate problem briefly

Middle: Key findings (1-2 each)

Impact: Why this matters

Recommendations: What's next

TONE:

- ✓ Confident but supported
- ✓ 'Results demonstrate that...'
- ✓ 'This study concludes that...'

⚠ Common mistakes:

- ✗ Introducing NEW information
- ✗ Repeating results verbatim
- ✗ Too long (>2 pages)
- ✗ Weak ending: 'More study needed'

REFERENCES - What & How

WHAT Sources Did You Use?

WHAT to include:

ONLY sources you cited in text:

[1] Author Name

[2] Another Author

[3] Third Author

DO NOT include:

✗ Sources you didn't reference

✗ Wikipedia (not academic)

✗ Websites without authors

FORMAT EXAMPLE (IEEE):

[1] H. E. Ross et al., 'Recommended Procedures for Safety Evaluation of Bridges,' National Research Board, Washington, D.C., 1993.

[2] TS EN 1991-1-2, 'Eurocode 1: Actions on Structures,' Turkish Standards Institute, Ankara, 2019.

HOW To Format Them Right?

HOW to organize references:

✓ Alphabetical by author

✓ Numbered in order cited: [1][2][3]

✓ Consistent format (APA or IEEE)

✓ Hanging indentation for clarity

GOOD SOURCES:

✓ Peer-reviewed journals

✓ Published textbooks

✓ Technical reports

✓ Standards (TS, EN, ISO)

✓ Government reports

HOW TO CITE IN TEXT:

First citation: 'According to research [1], concrete resists fire.'

Later: 'Studies show [1][5] that...'

⚠ Common mistakes:

✗ Citing without [#]in text

✗ Inconsistent format

✗ Missing publication details

✗ Including sources not cited

SECTION CHECKLIST - Before Submitting

- ❑ TITLE PAGE: Logo, title, supervisor, all names + IDs, date
- ❑ ABSTRACT: 200-300 words, clear problem + methods + findings, 5-6 Key Words
- ❑ INTRODUCTION: Motivation, literature context, objectives, organization clear
- ❑ LITERATURE REVIEW: 2-3 sources per theme, organized by topic not author
- ❑ METHODOLOGY: Past tense, specific & repeatable, equations numbered, standards referenced
- ❑ RESULTS: Tables/figures with captions, referenced in text, NO interpretation
- ❑ DISCUSSION: Explains meaning, compares with literature, acknowledges limitations
- ❑ CONCLUSIONS: Answers original questions, 1-2 pages, practical recommendations
- ❑ REFERENCES: All [#] citations matched, consistent format, authors/dates correct
- ❑ ALL CHAPTERS: Smooth flow, each has intro + conclusion, language professional
- ❑ FIGURES/TABLES: Every one numbered, captioned, referenced in text
- ❑ FORMAT: Font/spacing/margins consistent, page numbers correct

"Now you understand:

WHAT goes in each section

HOW to write it

WHAT mistakes to avoid

You can write a professional, well-organized technical report."