

# RESEARCH METHODS FOR DATA SCIENCE

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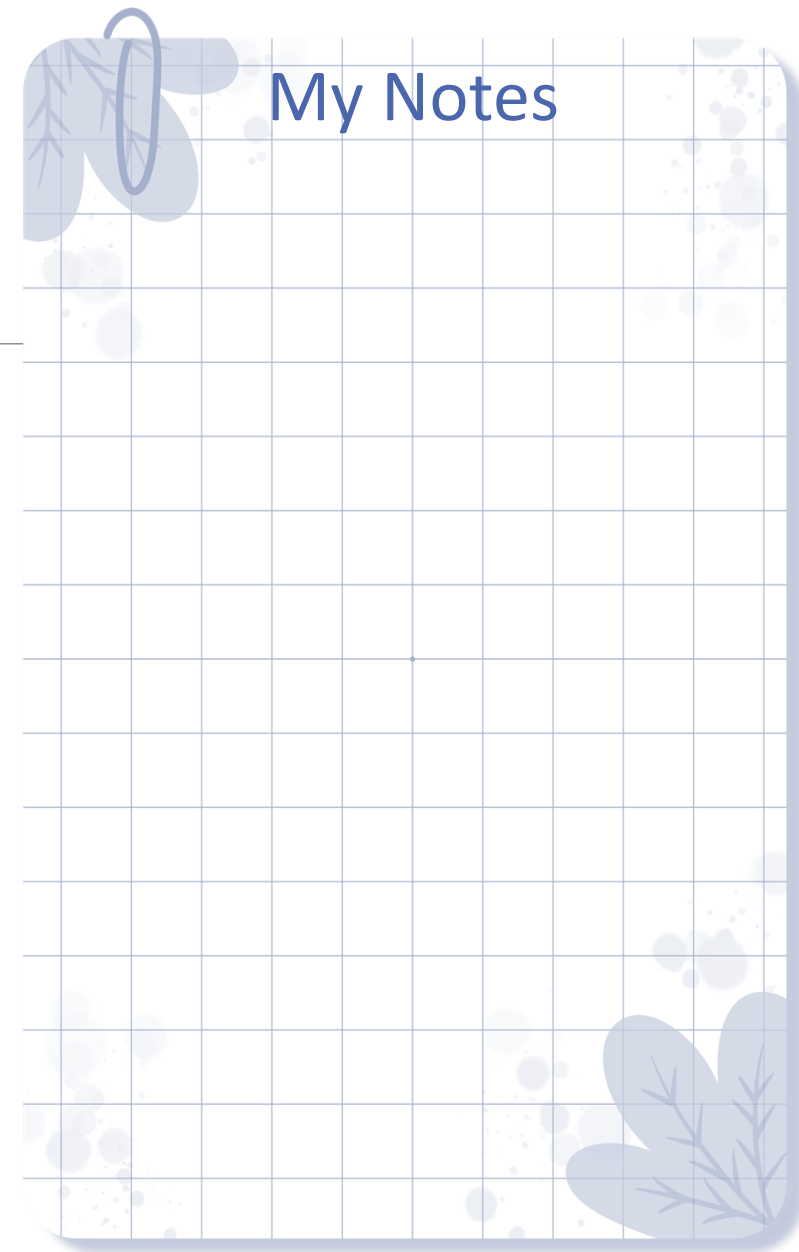
# THE EIGHT STEPS OF THE RESEARCH PROCESS



# The eight steps of the research process

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- 1: Formulating a research problem
- 2: Conceptualising a research design
- 3: Constructing an instrument for data collection
- 4: Selecting a sample
- 5: Writing a research proposal
- 6: Collecting data
- 7: Processing and displaying data
- 8: Writing a research report → a paper

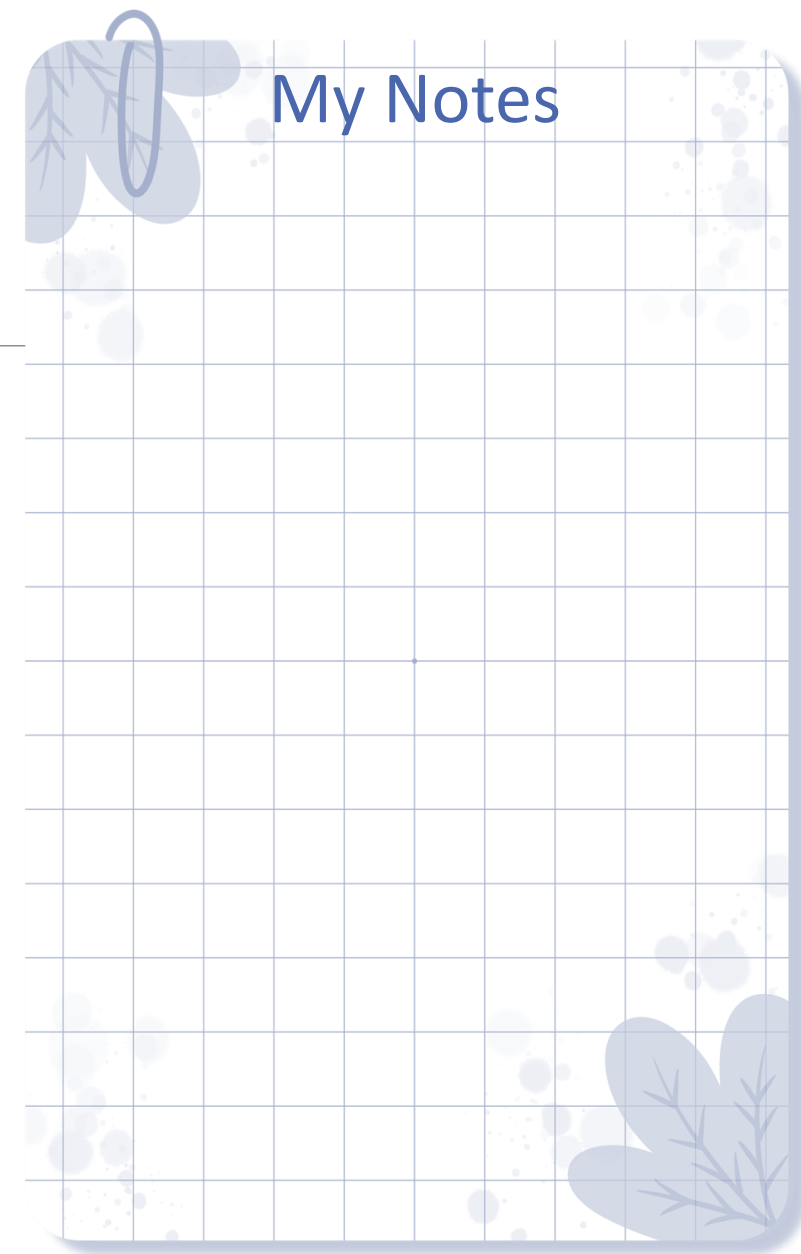




# When planning your research, don't forget:

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- ✓ Methodologies differ due to underpinning philosophy
- ✓ The process is the same for quantitative and qualitative research
- ✓ Each approach uses different research methods for data collection, data processing, analysis and style of communicating the findings



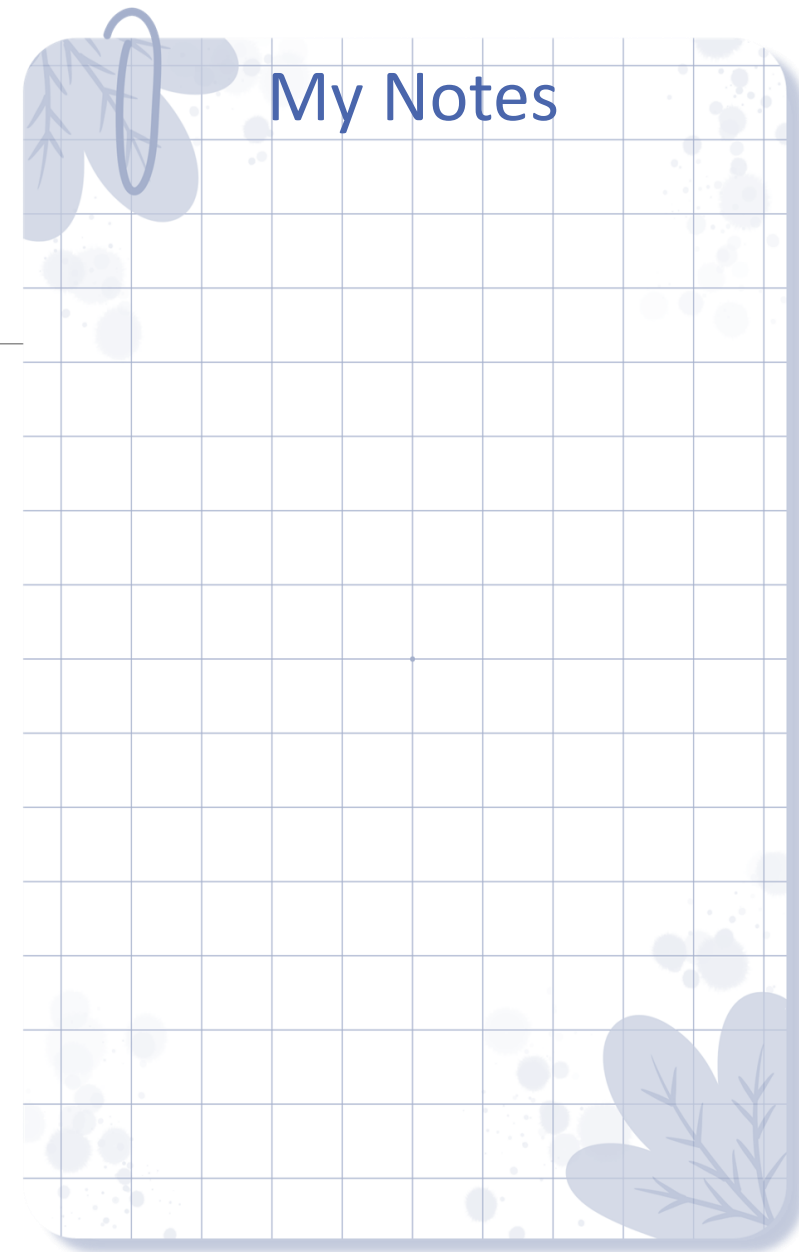
# Step 1: Formulating a research problem

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*This is the most important step, because the steps which follow are influenced by the research problem.*

*When formulating your problem think about:*

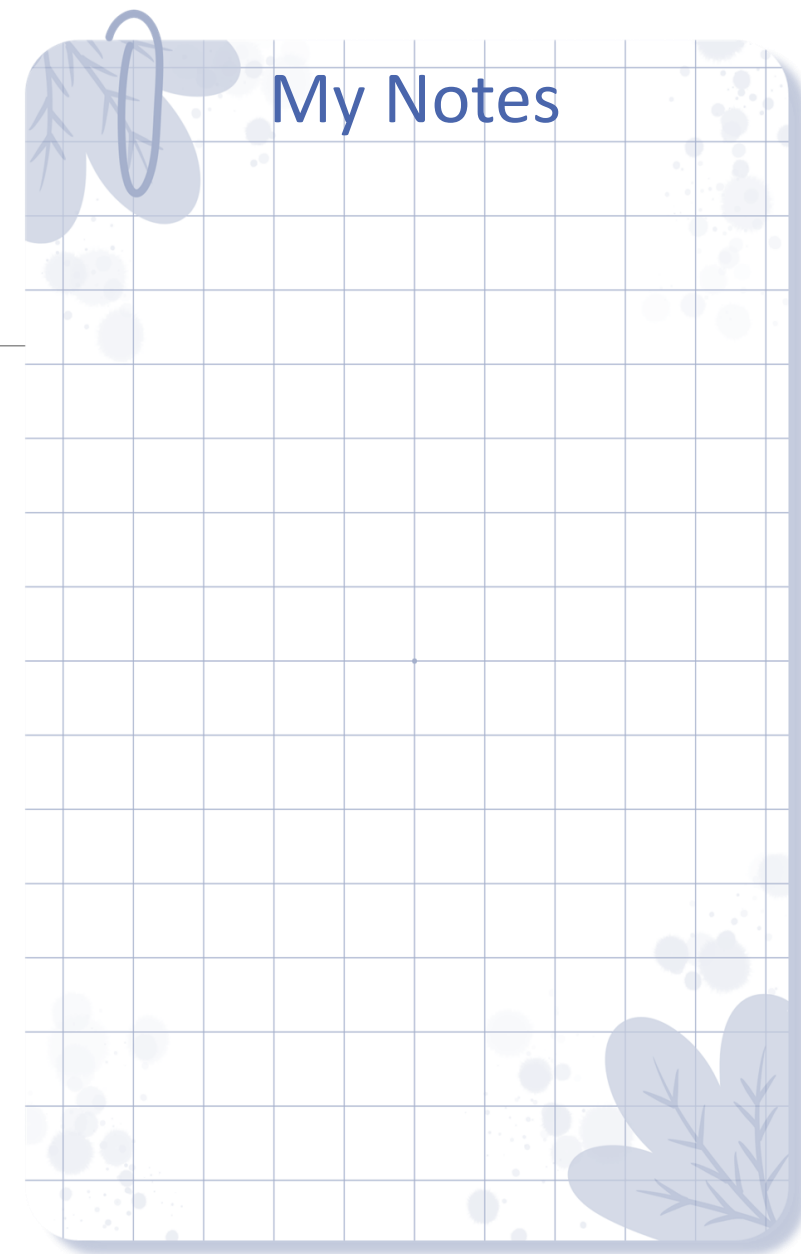
- ✓ **What** do you want to find out **about**?
- ✓ Have you got sufficient funds to do the research?
- ✓ Have you got the time available to conduct the study?
- ✓ Have you got knowledge of relevant disciplines?
- ✓ Do you have sufficient knowledge of skills needed?



# Step 2 : Conceptualising a research design

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- ✓ *What* you find depends on *how* it was found
- ✓ Select an appropriate research design:
  - Quantitative
  - Qualitative
  - Mixed methods
- ✓ The design has to be
  - Valid
  - Workable
  - Manageable
- ✓ Be aware of its strengths and weaknesses

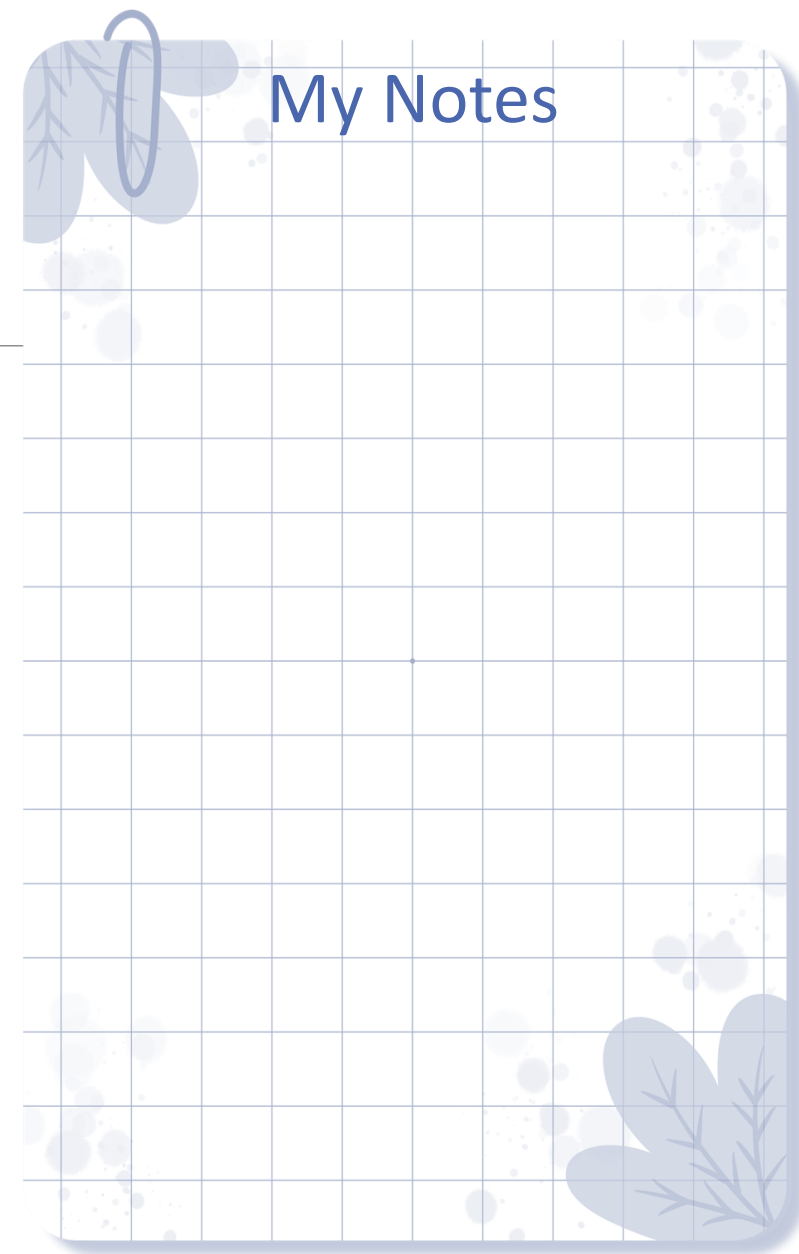


# Step 3: Constructing an instrument for data collection

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*How* will you collect your data?

- ✓ Construct a research instrument or research tool to collect data (interview schedules, questionnaires, notes on observations, diaries, interview guides, etc.)
- ✓ Or use secondary data (information already collected for other purposes)
- ✓ Pre-test your research tool (pilot study)



## Step 4: Selecting a sample

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*Ask yourself, who will take part in your research?*

- ✓ Select appropriate sample/participants to represent the study population
- ✓ Avoid bias
- ✓ Random / probability samples
- ✓ Non-random / non probability samples
- ✓ Be aware of strengths and weaknesses of different sampling methods

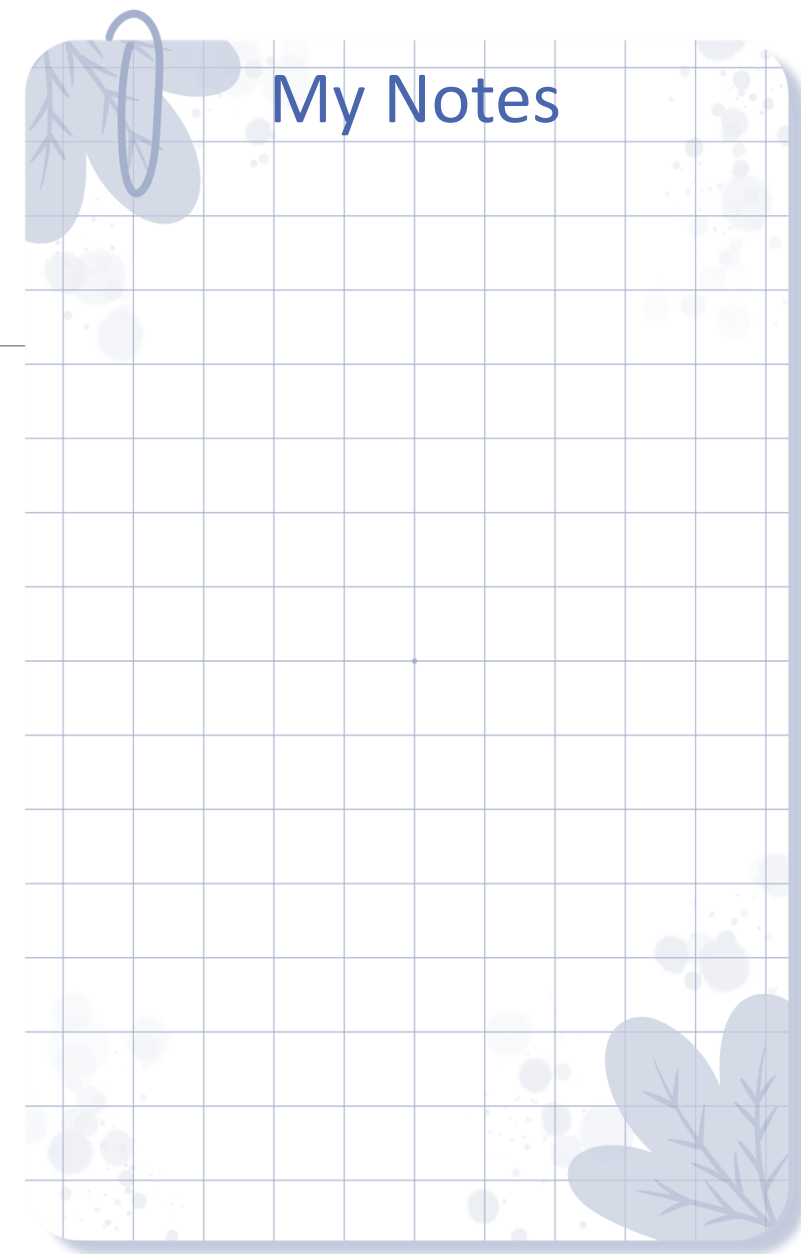


# Step 5: Writing a research proposal

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*Write a detailed plan about your research. Make sure you include:*

- *What* you are proposing to do
- *How* you plan to proceed
- *Why* you selected the proposed strategy



# Step 6: Collecting data

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*Collect your data using one or more data collection method, such as:*

- ☐ conducting interviews
- ☐ mailing out questionnaires
- ☐ Conducting focus groups discussions
- ☐ making an observation

Be aware of ethical issues!

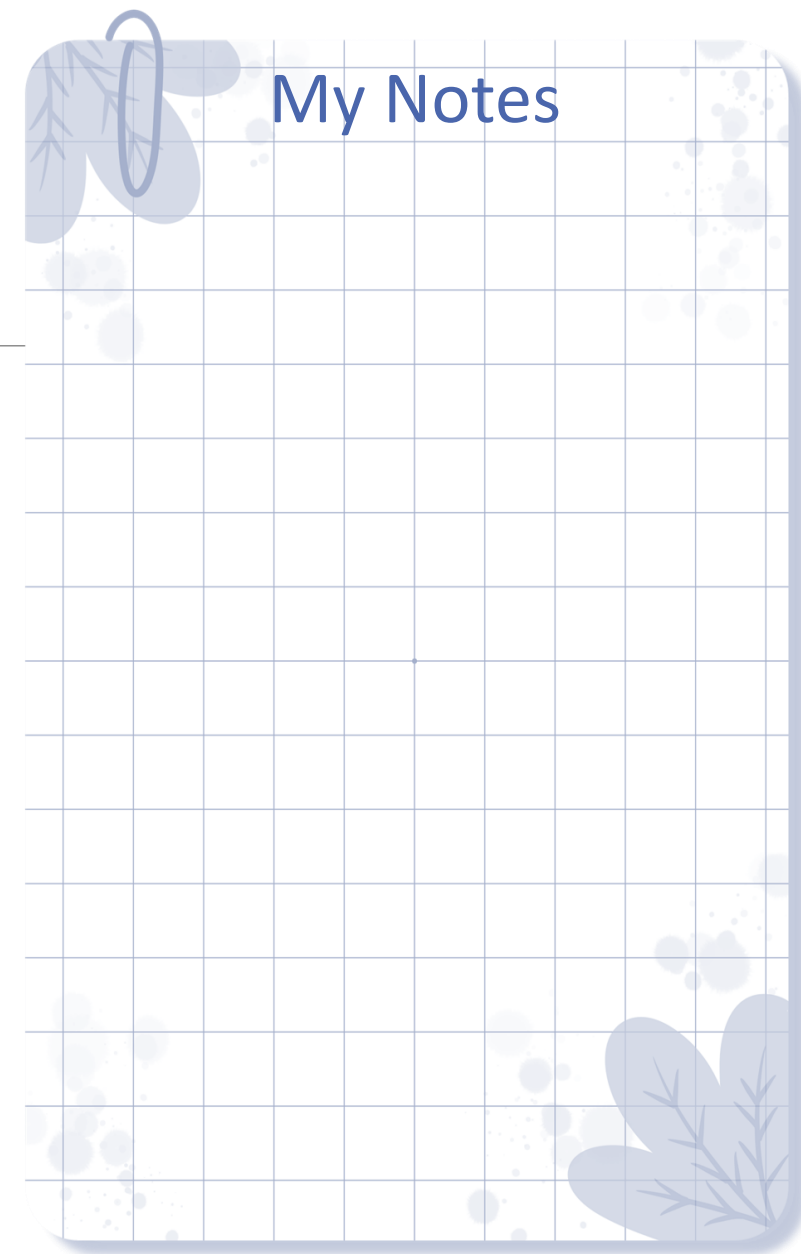
# Step 7: Processing and displaying your data

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*What did you find out?*

✓ Keep in mind. How you analyse your data depends on the *type* of information you collected. This also impacts how you communicate the findings.

- ✓ Distinguish between
  - Descriptive
  - Quantitative (statistical procedures)
  - Qualitative (narrative, content analysis etc)
  - Attitudinal

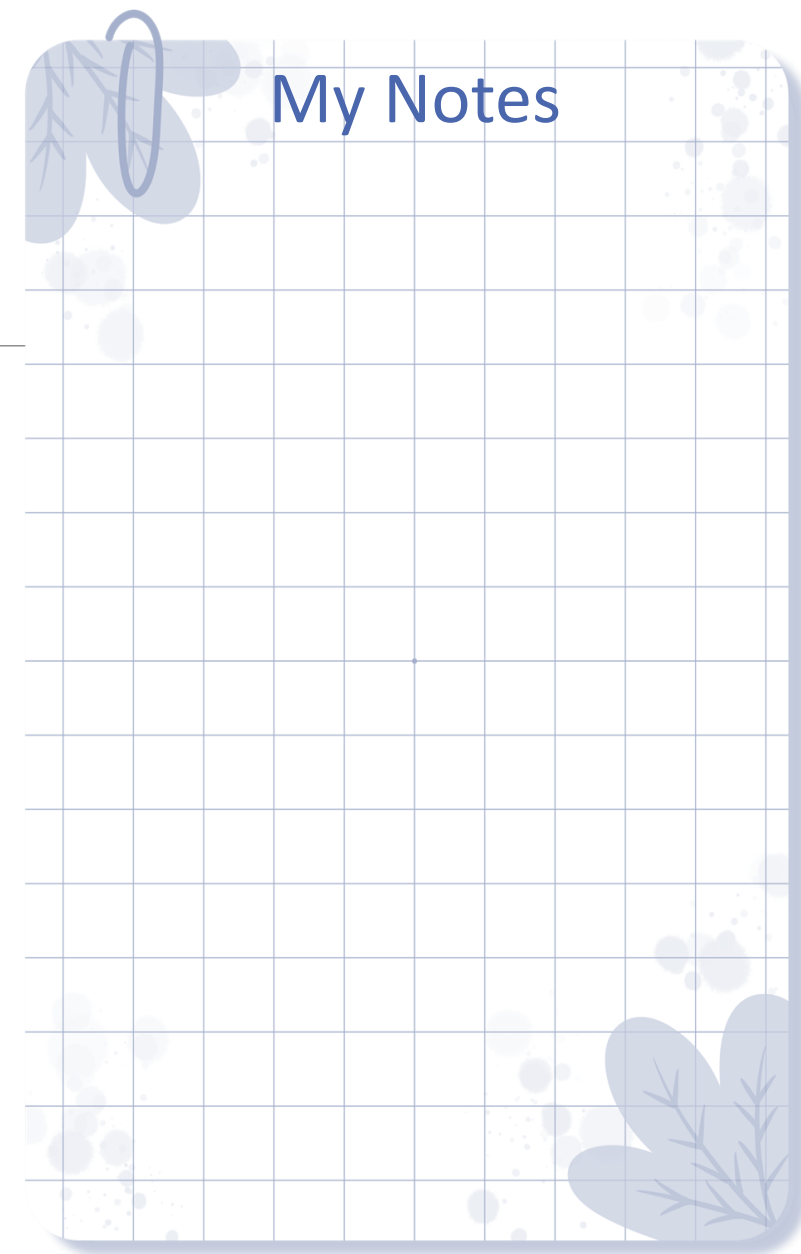


# Step 8: Writing a research report

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*Congratulations! Now that you have collected and analysed your data, it's time to write your report. In your report be sure to include:*

- ✓ *What you have done*
- ✓ *What conclusions you have drawn from the findings*
- ✓ *Different format for quantitative and qualitative research*
- ✓ *Structure using main themes of study*
- ✓ *Adhere to academic conventions*







Work hard to achieve integrity in  
your work and your relationships  
with the people you work with.

Rebel Wilson

quote fancy

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