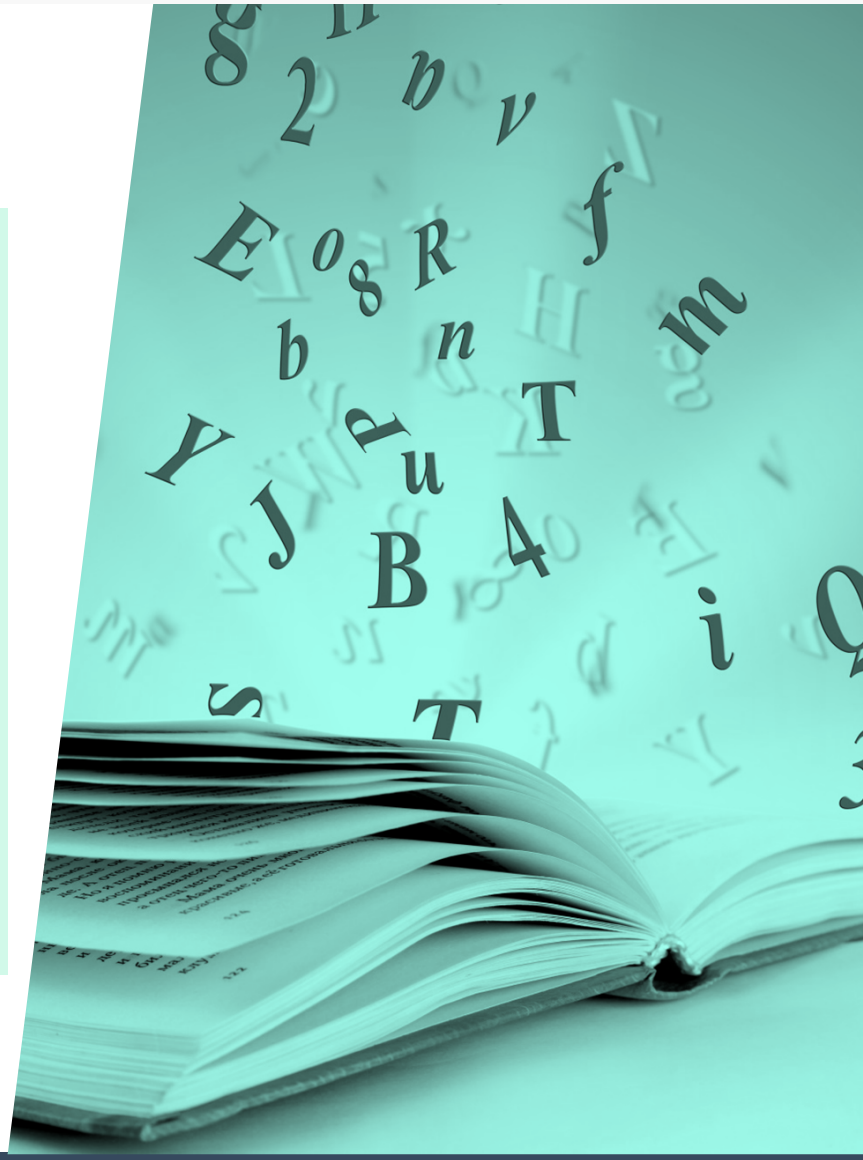
How to read a scientific article

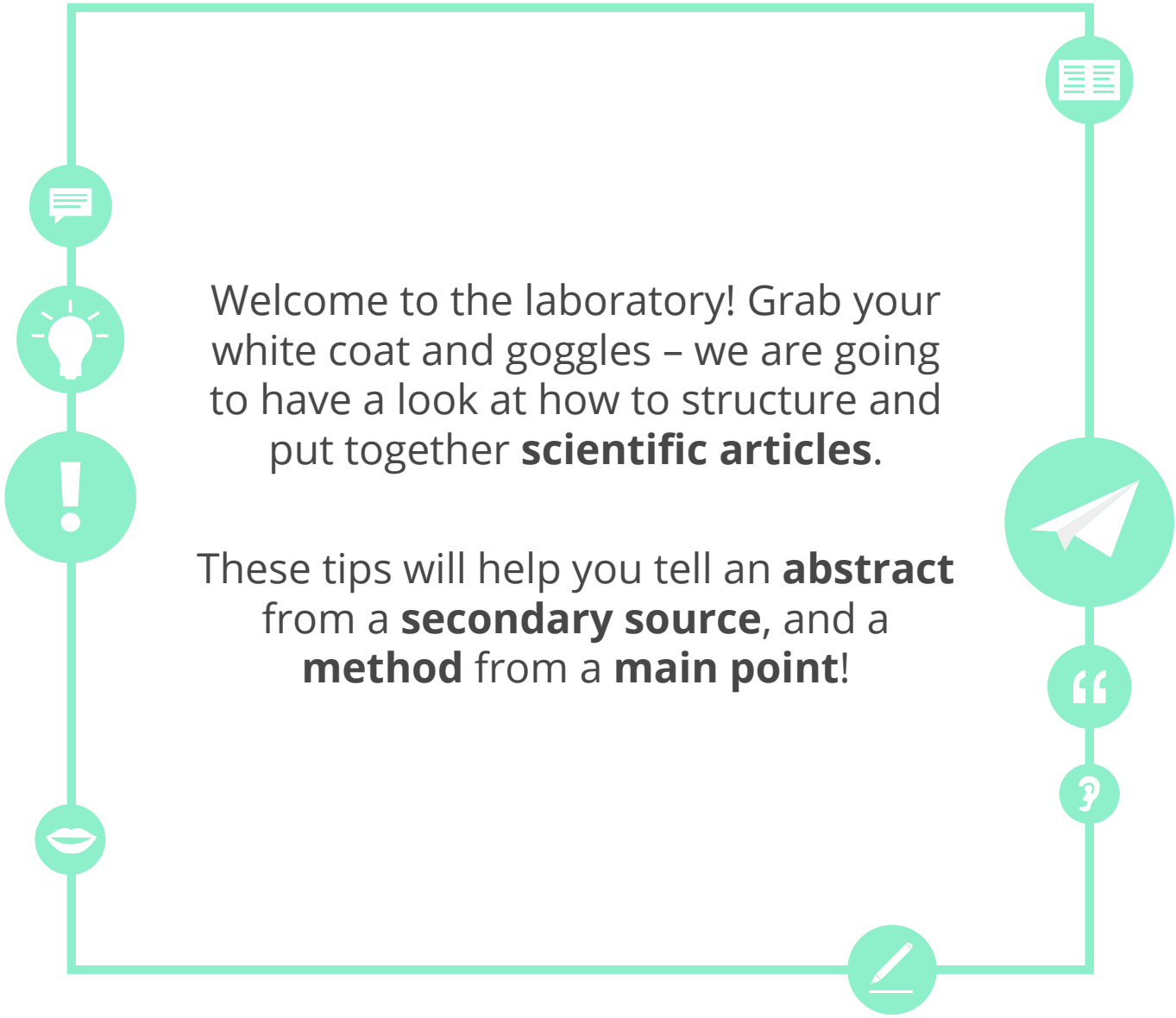
COMMUNICATION

LEVEL	NUMBER	LANGUAGE
Advanced	C1_3012X_EN	English

Goals

- Can recognise and recall the structure of a scientific article.
- Can effectively summarise the most effective way to read a scientific article and evaluate the sources used.





Welcome to the laboratory! Grab your white coat and goggles – we are going to have a look at how to structure and put together **scientific articles**.

These tips will help you tell an **abstract** from a **secondary source**, and a **method** from a **main point**!

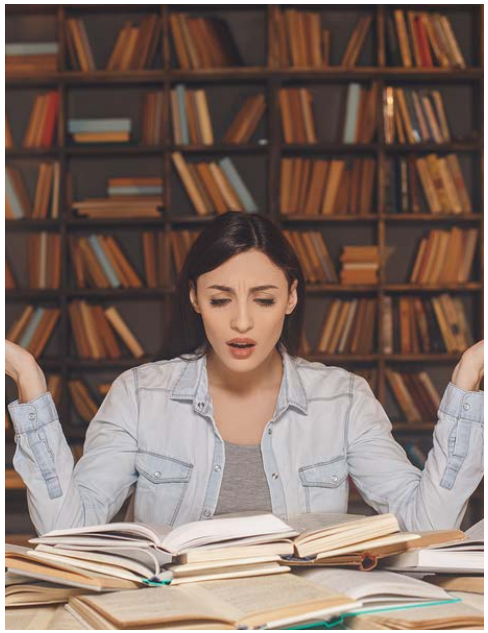
Reading

What kind of things do you **read for pleasure**?

When and where do you most like to read?

Reading academic articles

Answer the questions below with your classmates or teacher.



1. Do you have to read academic articles for your job or studies?
2. Do you ever read them in English?
3. Do you find them difficult to read?

Scientific articles

If you could read a scientific article on any topic, which would you choose and why?

The goal of a scientific article

- The **goal** of a **scientific article** is to **support** or **refute** a **hypothesis**. In order to do that, they provide **arguments** and **evidence**.

This paper will show that...

The structure of a scientific article

- Below is the standard **structure** of a **scientific article**.

abstract and introduction
premises and definitions
argument(s) or evidence
conclusion
bibliography and source references

The abstract and introduction

An **abstract** is a very **brief summary** of the article which is not more than 500 words. It should serve the purpose of making a potential reader aware of the **content** of the article before they start reading. After the abstract, there is normally a **lengthier introduction** explaining the **context** of the **problem** that will be dealt with and a longer **summary** of the article stating what each part of the article is about.

In part one, I will present the **premises** and **definitions**.

The premises

Scientific articles normally **take** some **information for granted** and normally they state this in the **premises**. The authors **expect the reader** to **agree**.

A **premise** is the assumption that something is true.

Definitions

- Along with the **premises**, we have the **definitions** of **terms** which will be used in the **article**.

- **Scientific articles** need to be **precise** and **specific** so terms must be defined.
- Some readers might assume a **different definition** to the one the author means – this can lead to **misunderstandings**.

A scientific article

Write down the five main parts that you find in a scientific article.

Part 1

Part 2

Part 3

Part 4

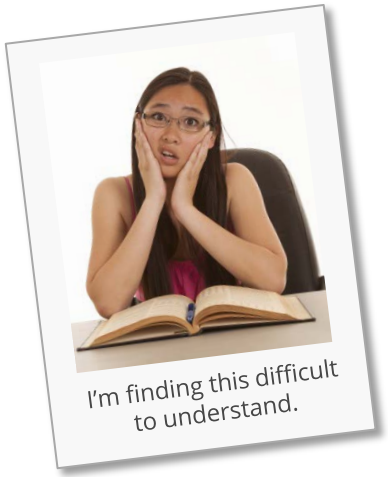
Part 5

Abstract and introduction

Explain the difference between an abstract and an introduction.

Premises and definitions

If you disagreed with the premises in an article, would you continue to read it?



What would you do if you did not understand the definitions in an article?

The arguments

The **arguments** (and evidence) section is the most **important** part of an academic article. The **argument** has to be **clearly** and **logically structured**: normally, authors avoid any literary or **metaphoric language** and explain **every single step** of the argument for it to be **clear**.

The **arguments** are the logical connection between the premises and the conclusion. There can be many different types of arguments.

Primary source

Secondary source

Along with the arguments, a **scientific article** will have **evidence**.
This might come in the form of **primary** or **secondary sources**.
Primary sources are **original research** or **materials**.
Secondary sources are written using the primary sources as evidence.

Most **articles** quote **primary** and **secondary sources** as evidence.

The conclusion

In the **conclusion**, there is normally a **brief recap** of everything said to make clear why the author believes in the point expressed as a conclusion. There may be **more than one conclusion**, but in that case it has to be clear which arguments and evidence support which conclusion.

In **conclusion**, it is clear that...

Bibliography and source references

- At the very end, the author should **cite the references** in the **bibliography**.

- It is very important that scientific articles **provide references** to the **sources** that they gathered information from.
- There are **different ways** and **formats** to provide these references and each of them is normally very strict.

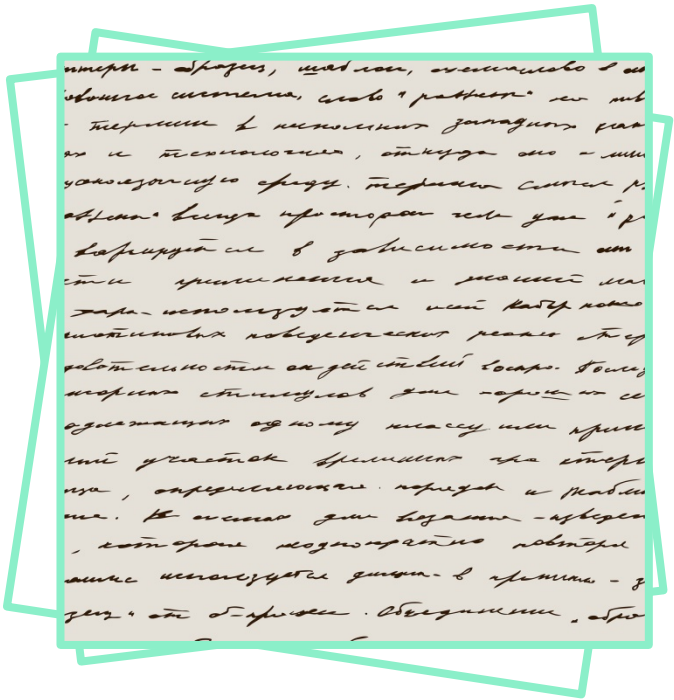
Complete the sentences

Using the information you have just read, complete the sentences in your own words.

1. The arguments must be...
2. A primary source is...
3. A secondary source is...
4. The conclusion should...
5. In the bibliography you will find...

Primary and secondary sources

When writing articles at university, did you use primary and secondary sources? Which are easier to use and which are more useful?



The bibliography

Do you know how to write a bibliography and provide references for sources? Can you name any referencing systems or tools?

Reading in order

- Normally when we are reading an article we start at the beginning and read through to the end. However, this **logical order** is not always the best way to **read a scientific article**.

The best order to read a scientific article
Start by reading the introduction, not the abstract.
Identify the main point of the article and the specific questions it answers.
Read the methods section, which shows what the author did (in arguments and evidence).
Read the results.
Read the conclusion.

Reading a scientific paper

- The previous page gave you **the order** to read a **scientific paper** in.
- Below you have the **reasons** for the order and **more detail** about what you should be looking for.

Introduction	Read the introduction to get a summary of the paper. Do not read the **abstract** first because it contains the **author's conclusions**, which might make you **biased**.
Main point and specific questions	What problem does the author want to **solve** and which specific questions do they want to answer? Make a note of these to refer back to.
Methods section	Make sure you understand how the author has processed any **results** and **data**. Look up anything you don't understand.

Reading a scientific paper

- Here you have some more **reasons** for the order and **more detail** about what you should be looking for – along with an extra final step.

Results	**Summarise** the results yourself but do not try to **interpret** them yet. For all of the results check the margin of error and the sample size. Ask yourself if the results answer the questions.
Conclusion	Read the author's conclusions from the results. Do you agree with their conclusions?
Final step: read the abstract and check what others say about the article	Now you can read the **abstract** and decide if you agree with it. You should also read what other people think about the article – do they support it or are they **critical**?

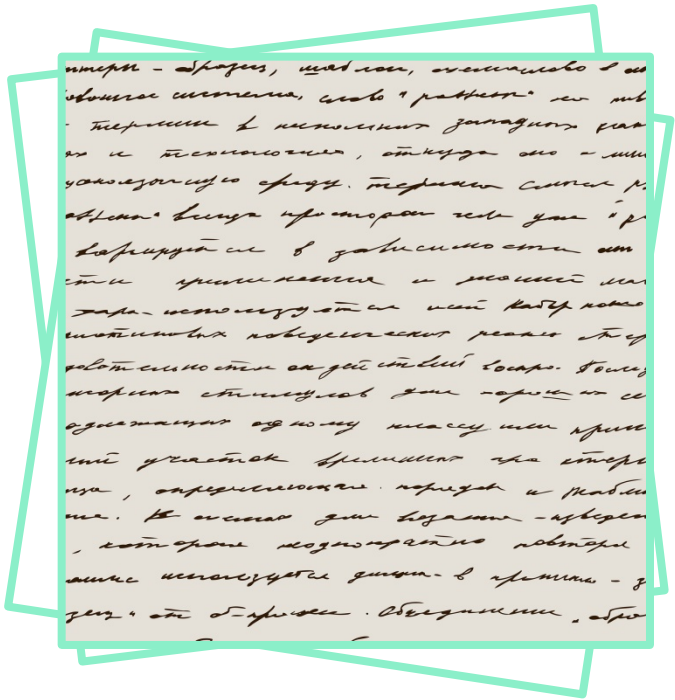
More tips

- Here are some **final tips** for reading a **scientific article**.

- **Skim read** the article first, especially the introduction, to make yourself aware of the **key points**.
- If you don't understand a **word or phrase**, you can look it up quickly or, if it doesn't impede your **understanding** of the whole article, skip it.
- If you don't understand the whole article, **read a review** written by someone else first.

Writing

Write a bullet point list of the best order in which to read an article.



Order of reading

Do you agree with the order that is proposed here when it comes to reading a scientific article?

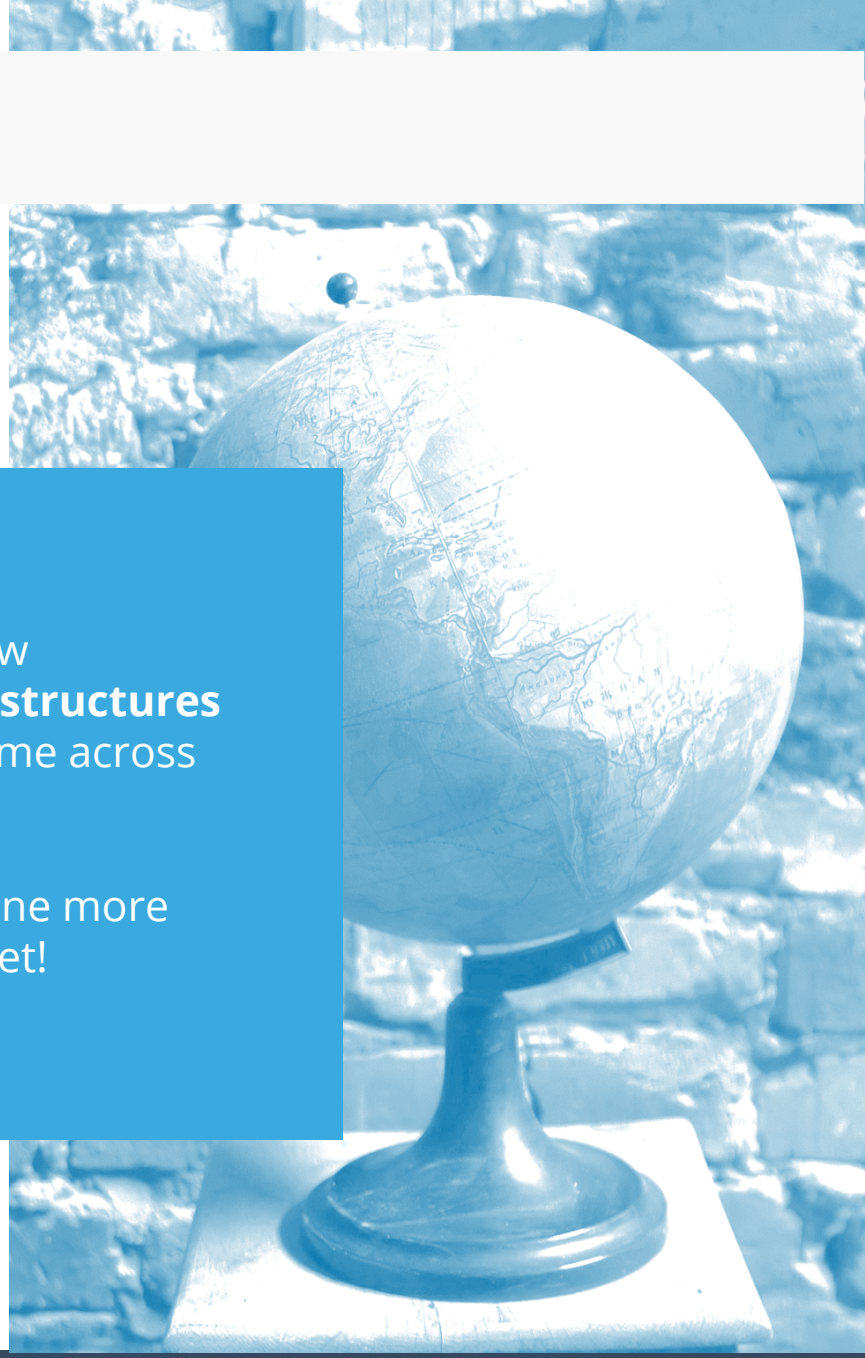
Do you have any other ideas on how to order your reading?

Disagreeing

Have you ever read an **article** and **disagreed** with the **author's conclusions** or **research methods**?

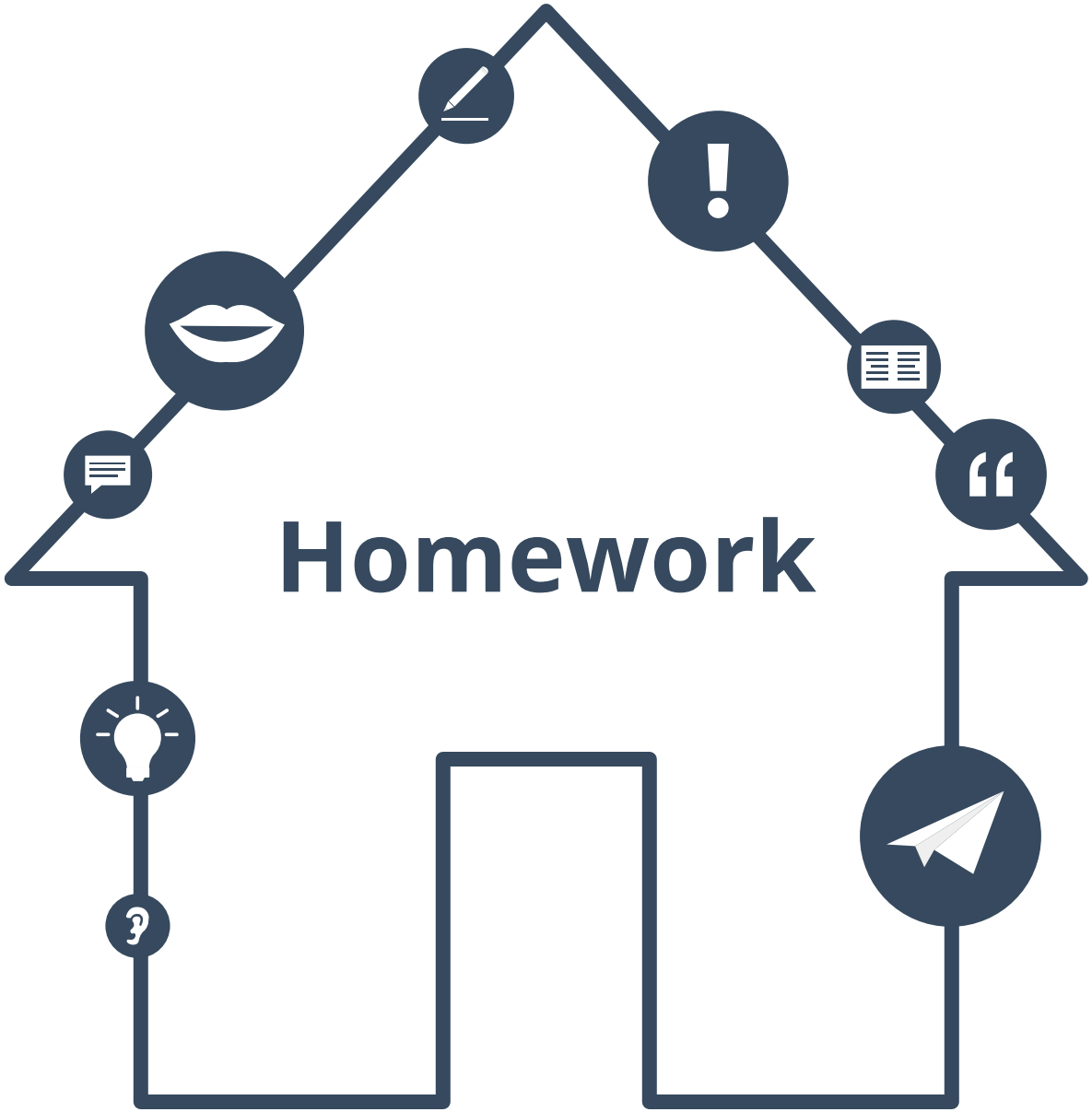
What did you or would you do in such a situation?

Reflect on this lesson



Take a moment to review any new **vocabulary**, **phrases**, **language structures** or **grammar points** you have come across for the first time in this lesson.

Review them with your teacher one more time to make sure you don't forget!


Homework

Multiple choice

1. When reading a scientific article you should…

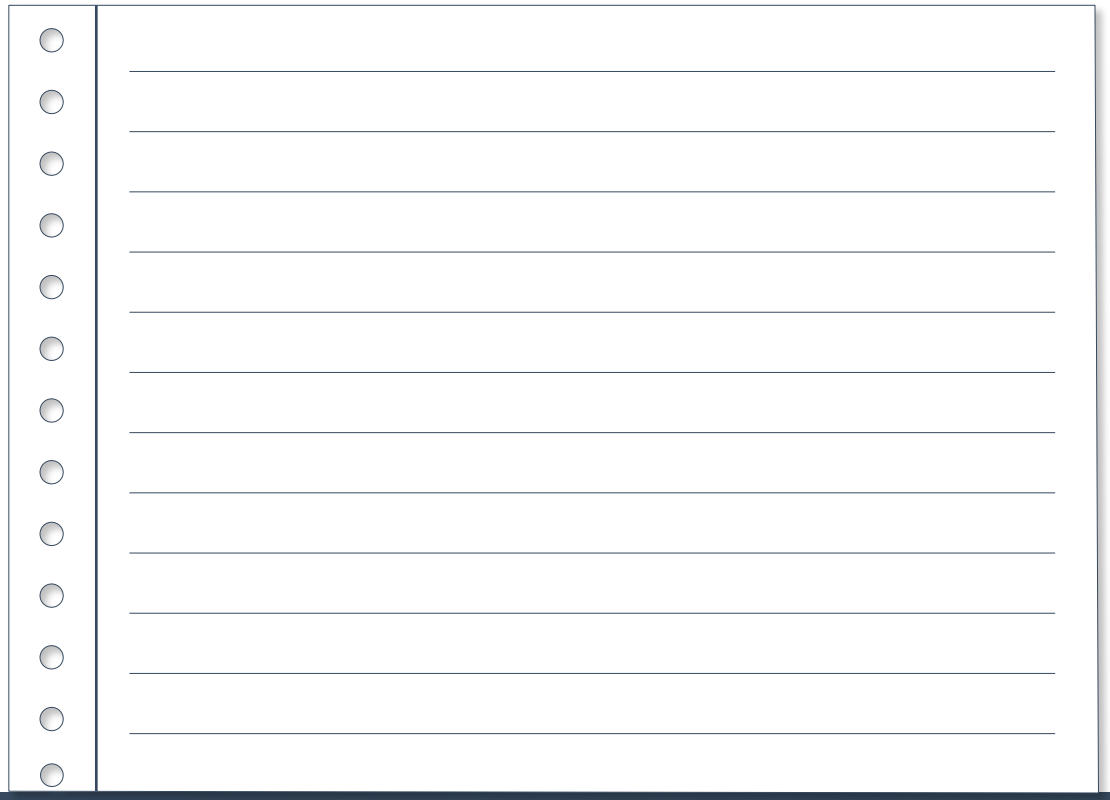
   a. **first read the abstract and then the introduction.**
   b. **first read the introduction and then the abstract.**
   c. **first read the introduction and then read the abstract at the very end.**

2. When reading a scientific article you should…

   a. **draw your own conclusions from the results.**
   b. **read the author's conclusion before looking at the results.**
   c. **not draw your own conclusions and only look at the author's.**

Writing

Write a brief description of the best way to read an academic article. Make sure you include as much as the vocabulary from the lesson as you can.



Homework answer key

Exercise p. 31

1. c, 2. a

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