Εργαστήριο Κυκλοφορίας,
Μεταφορών
και Διαχείρισης Εφοδιαστικής
Αλυσίδας

How to do your research

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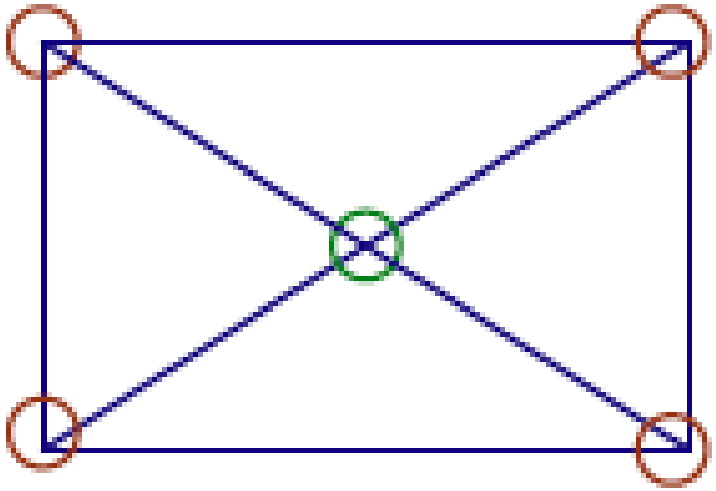
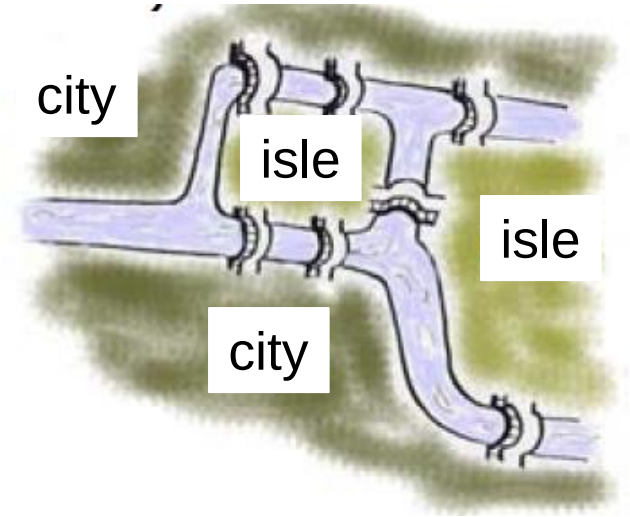
How simple can research be?

- A game …

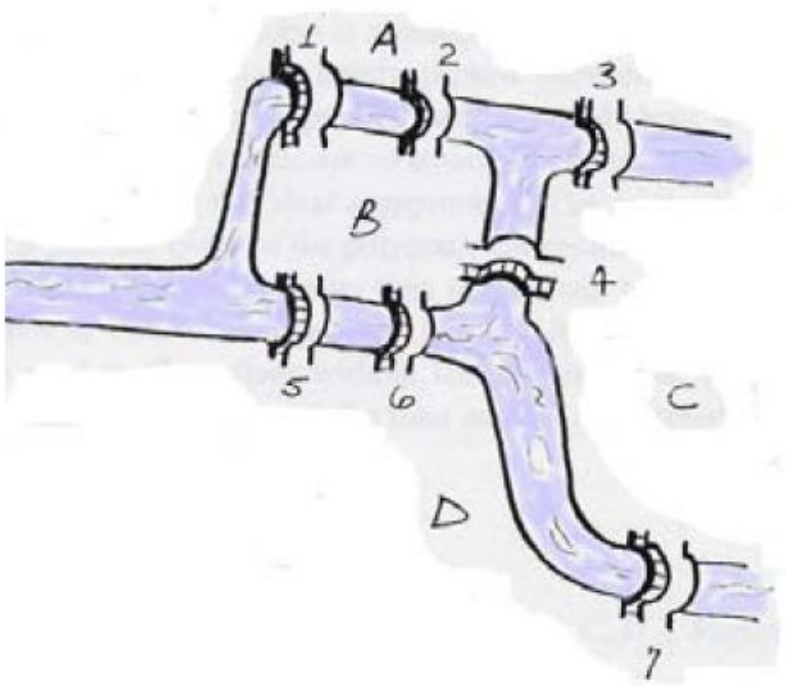


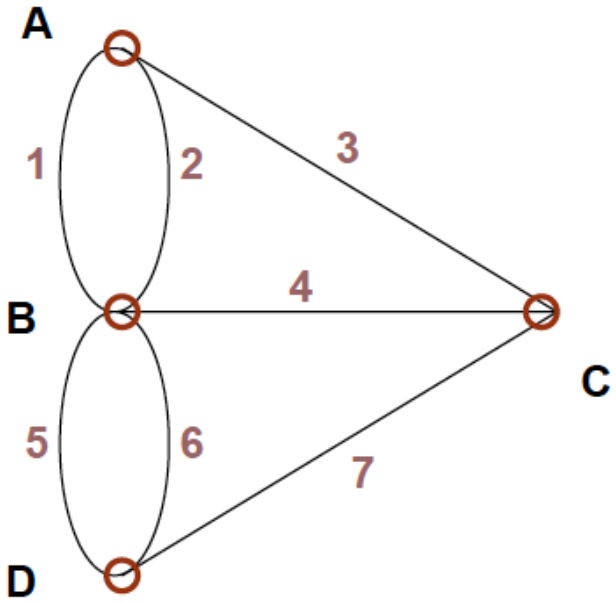
The Leonhard Euler theorem

- The Koningsberg (Kaliningrad, Russia) 7 – bridge problem …..



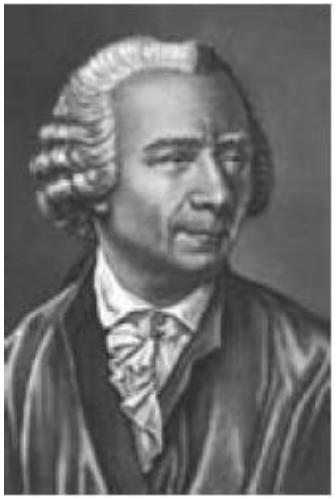
- topology

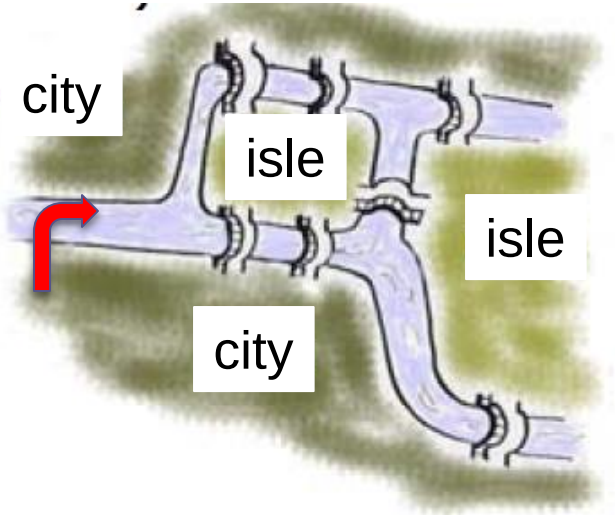




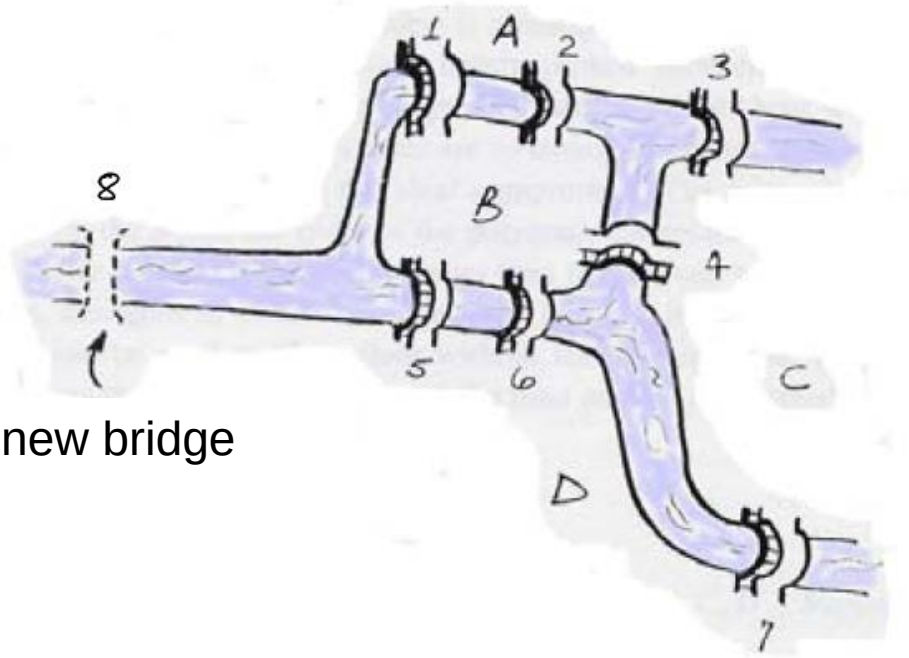
The Leonhard Euler theorem

- The Koningsberg (Kaliningrad, Russia) 7 – bridge problem was solved by the addition of an eighth bridge

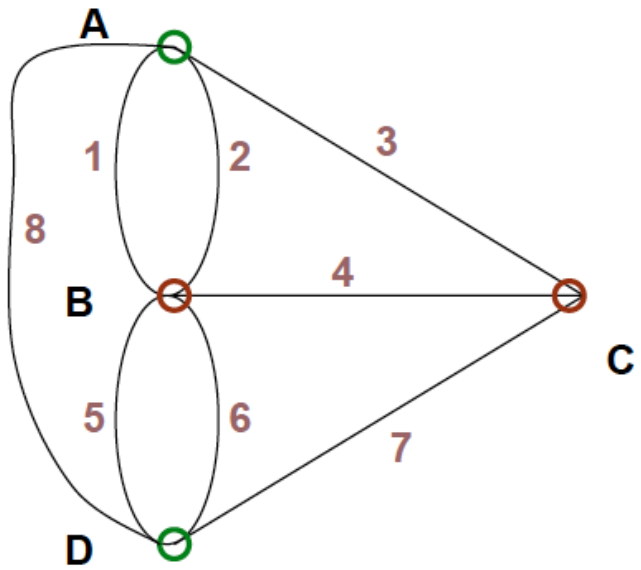




- topology

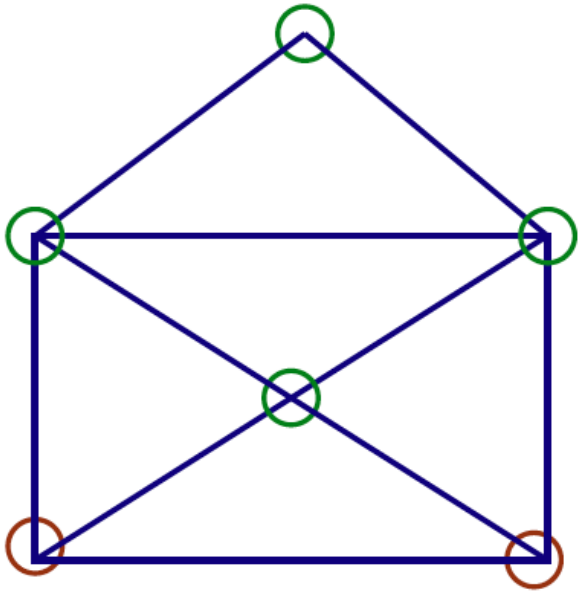


new bridge



The Euler theorem

- The number of “odd” nodes should be 0 or 2
- The itinerary should start and end at an “odd” node



Research dissemination

- Promote and exchange knowledge.
- Inform the scientific community.
- Safeguard research results.
- Contact potential cooperators.
- Demonstrate accountability.
- Facilitate fund raising.
- Enable researcher’s promotion.

Research dissemination through …

- Writing of a paper.
- Presenting a topic at a conference.
- Preparing a poster presentation.
- Other …

Different kinds of papers

- Journal paper
- Conference paper
  - Scientific paper
  - Technical paper
  - Poster

Key roles in the course of publication

Typical structure of a research paper

1. Introduction
2. State-of-the-art
   - Literature review
   - Contribution of own research
3. Methodology/Experiments/System
4. Analysis and discussion
5. Conclusions
   - Final concluding remarks
   - Future work

The “IMRAD” structure

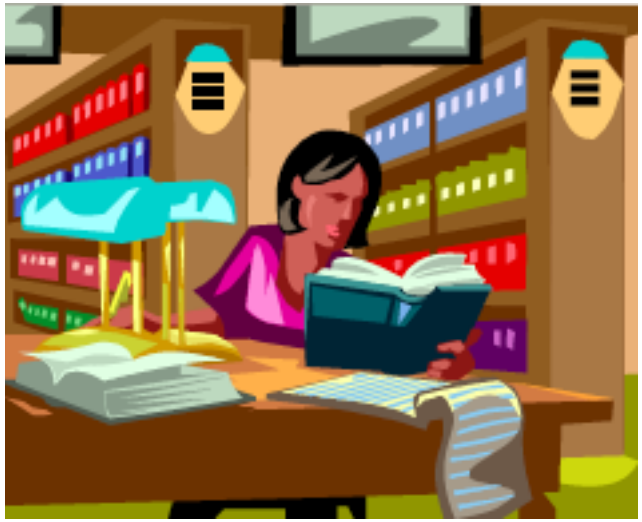
- **I**ntroduction (purpose, background or tested hypothesis)
- **M**ethod (when and how the study was done)
- **R**esults **A**nd (results and outcomes achieved)
- **D**iscussion (key concluding remarks, benefits and future research)

Design your research

- Decide on what you will pursue.
- Focus on a topic not too broad, not too specific.
- Gather all necessary information.
- Criticize the quality of your sources.
- Check all possible “solutions”.
- Foresee the “failure” possibility and plan for remedial actions.
- Start your research.

Literature review

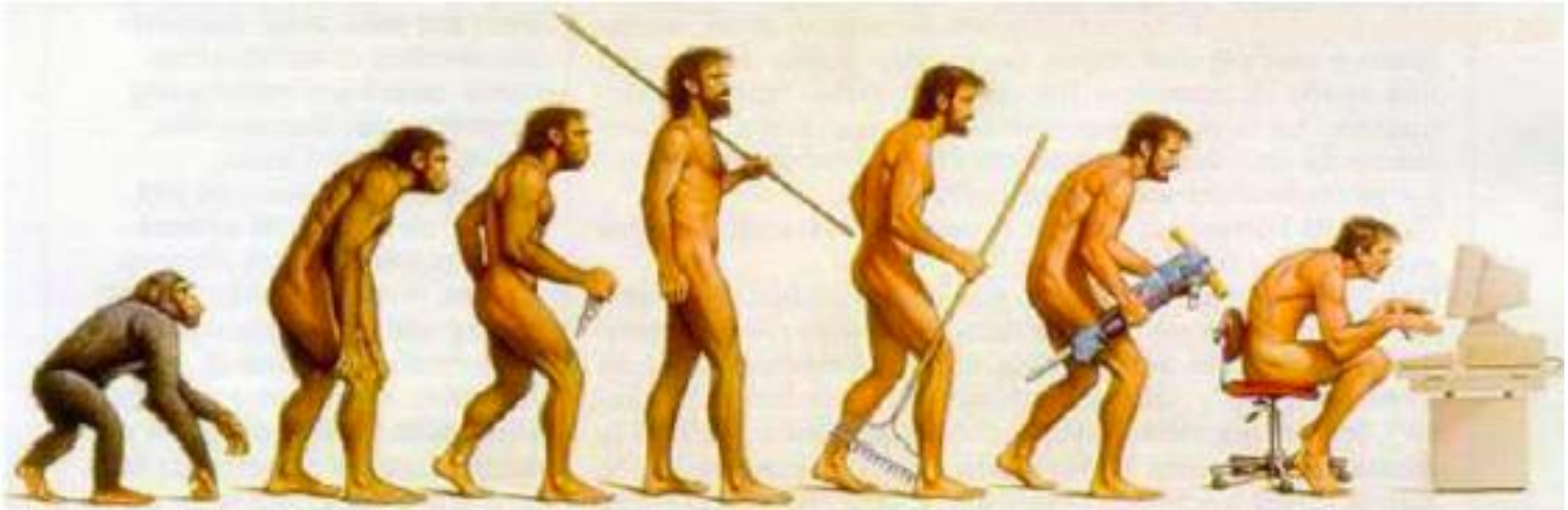
- Conduct a review on the research field addressed in your paper and present relevant and outstanding methods/results achieved by others



- Present the added value of your own research and your contribution to the current research agenda
- Plagiarism is unacceptable

Highlight the innovation of your research

- Underline what new your research brings to the scientific community
- Justify why your research idea or method is better than others



Remember in the course of evolution, man relied heavily on invention and innovation

Unique thinking

- Avoid inaccurate generalizations.
- Avoid arbitrary conclusions.
- Accept possibility of different approaches.
- Avoid stereotype thinking.
- Assess the degree of certainty of your sources.
- Evaluate your results.

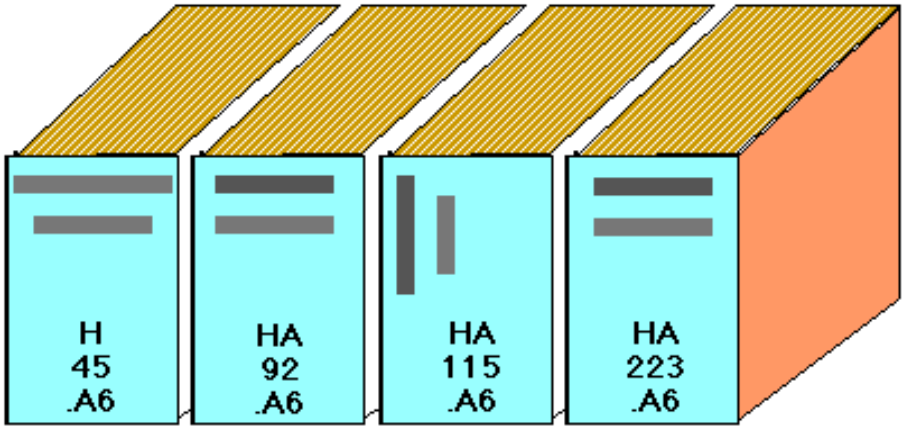
Document your sources

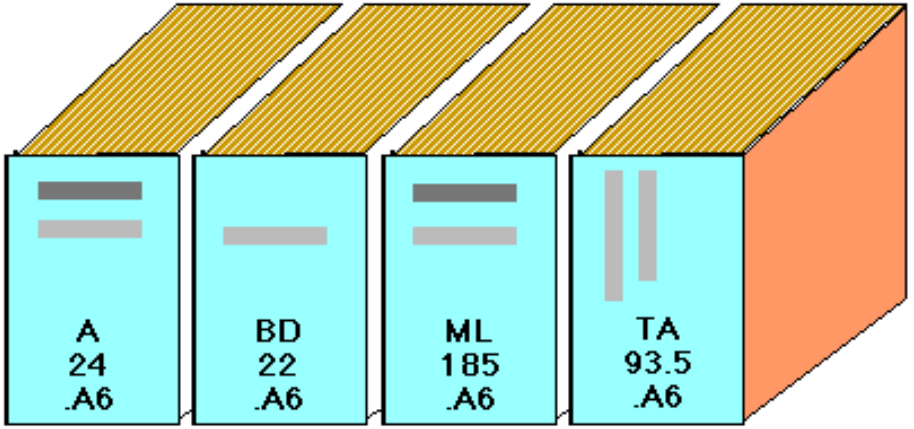
- Avoid presenting ideas and words as your own (“plagiarism”, according to Webster's dictionary).

- Citate properly every time you use a source.

Locating information

(a) Books





Locating information

(b) Journals

- Journal indexes (magazines, scholarly journals) tie together journals and articles on your subject.
- Each subject area has its own journal index.
- Be sure you are using the correct index for your subject.

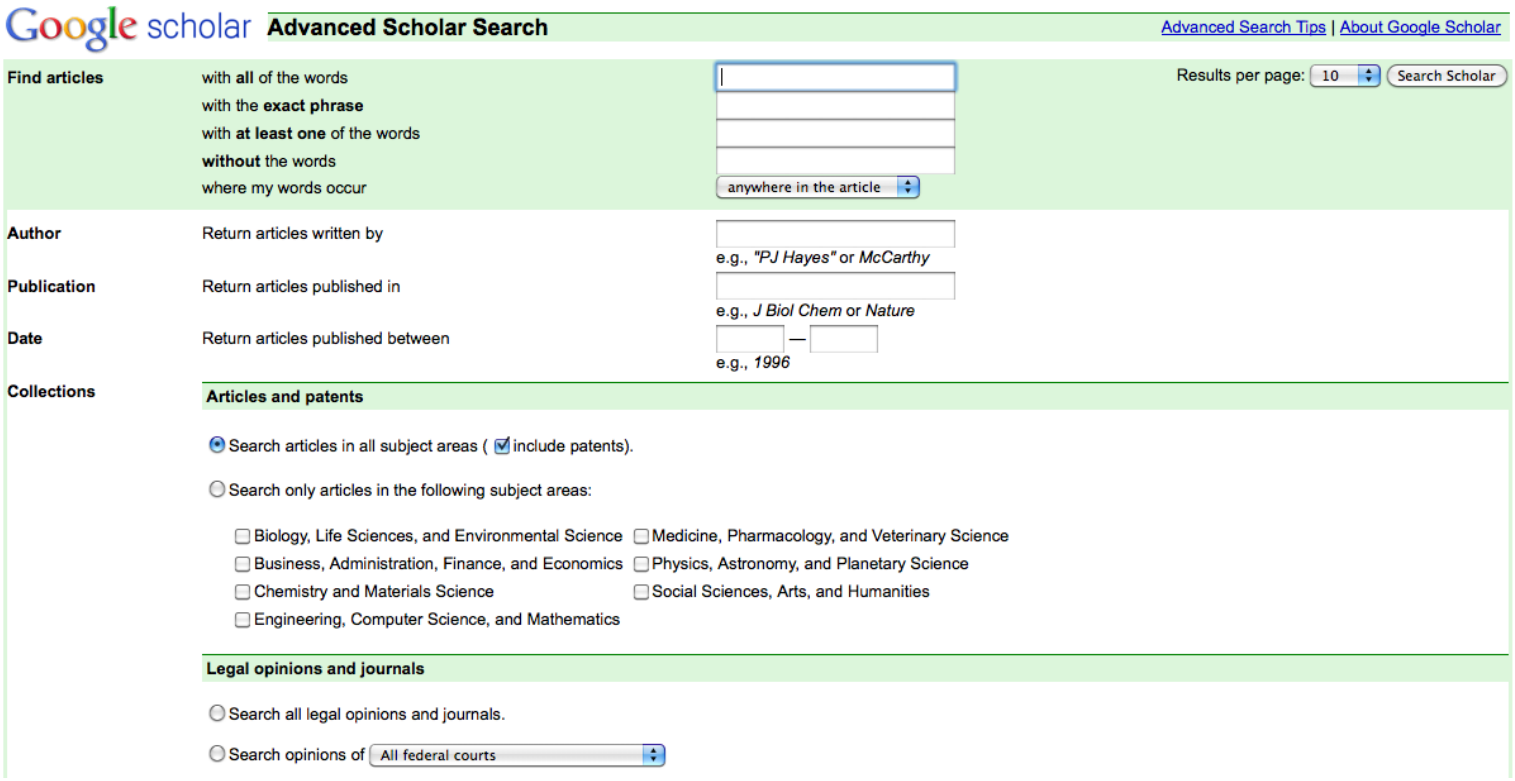
Locating information

(c) Newspapers

For accessing the most recent day-to-day events, such as:

- international, or bi-lateral agreements
- local and national politics
- natural disasters
- social problems, other events, etc.

Internet is a powerful source



Internet

Name	Discipline(s)	Description	Access Cost	Provider(s)
Academic Publications eJournal	Multidisciplinary science (student based)	Student driven research abstracts, posters, articles, science specific search engine, public forum [1]	Free	APeJ search[2]
Academic Search	Multidisciplinary	Several versions: Complete, Elite, Premier, and Alumni Edition[3]	Subscription	EBSCO Publishing [4]
Directory of Open Access Journals	Journals		Free	Lund University[45]
Google Scholar	Multidisciplinary		Free	Google[56]
Science Citation Index	Science (General)	Part of Web of Science	Subscription	Thompson Reuters[105]
ScienceDirect	Multidisciplinary		Subscription	Elsevier[106]
Scirus	Science (General)		Free	Elsevier[107]
Scopus	Multidisciplinary		Subscription	Elsevier[108]
SpringerLink	Multidisciplinary		Free abstract & preview;	Springer [116]

Scientific search engines

Science Direct	http://www.sciencedirect.com	Numerous journals and articles, including transportation and road safety issues. Full text available.
Resource Discovery	http://www.intute.ac.uk	Search engine for education and research. Covers a wide range of transportation aspects.
Scirus	http://www.scirus.com	Web search engine for scientific information, including transportation engineering and road safety.
Google scholar	http://scholar.google.com	Search engine for papers, articles and citations
Scopus	http://www.scopus.com	Search engine for papers, articles and citations, wide variety of transportation and safety issues
Complete Planet	http://www.completeplanet.com	A comprehensive listing of websites, including transportation engineering aspects.
Turbo10	http://turbo10.com	General interest deep web search engine.
Find Articles	http://www.findarticles.com	Article search engine, covering several issues - not engineering orientated. No full text available.

Transportation related search

TRIS	http://ntlsearch.bts.gov/tris/index.do	Transportation related search engine. Articles, journals, publishers and authors can be found.
Science.gov	http://science.gov	A USA goevrnment gateway to over 50 million pages of authoritative selected science information
TLCat	http://ntl.bts.gov/link.html	Transportation Libraries Catalog. Scientific search engine specialized on transportation.
IPL	http://www.ipl.org	The "Internet Public Library" webportal with links to various scientific websites, including transportation related.
Ntis	http://www.ntis.gov	The National Technical Information Service offers scientific, technical, engineering, and business related articles (abstracts only).
SAE	http://www.sae.org	Webportal of the Society of Automotive Engineers. Abstracts of papers available for free - full text through payment.
ENGnetBASE	http://www.engnetbase.com	Engineering handbooks publisher - Not available free of charge.
Digital Engineering Library	http://www.digitalengineeringlibrary.com	Internet engineering library - Not available free of charge, only abstracts available

Journal key performance indicators

Rank	Abbreviated Journal Title	Total Cites	Impact Factor	Immediacy Index	Articles	Cited Half-life
2	IEEE T INTELL TRANSP	178	0.982	0.122	41	3.5
7	J ADV TRANSPORT	93	0.533	0.000	16	
13	TRANSPORT RES A-POL	619	0.646	0.083	48	8.6
14	TRANSPORT RES B-METH	1266	1.411	0.295	44	8.8
15	TRANSPORT RES C-EMER	305	0.651	0.000	16	6.2
20	TRANSPORTATION	382	1.190	0.143	28	6.5

Reference sources

Reference source refers to brief and specific information or gives a concise introduction to a topic:

- Encyclopedias
- Dictionaries
- Almanacs
- Directories
- Sources of statistics

Four basic rules for writing your paper

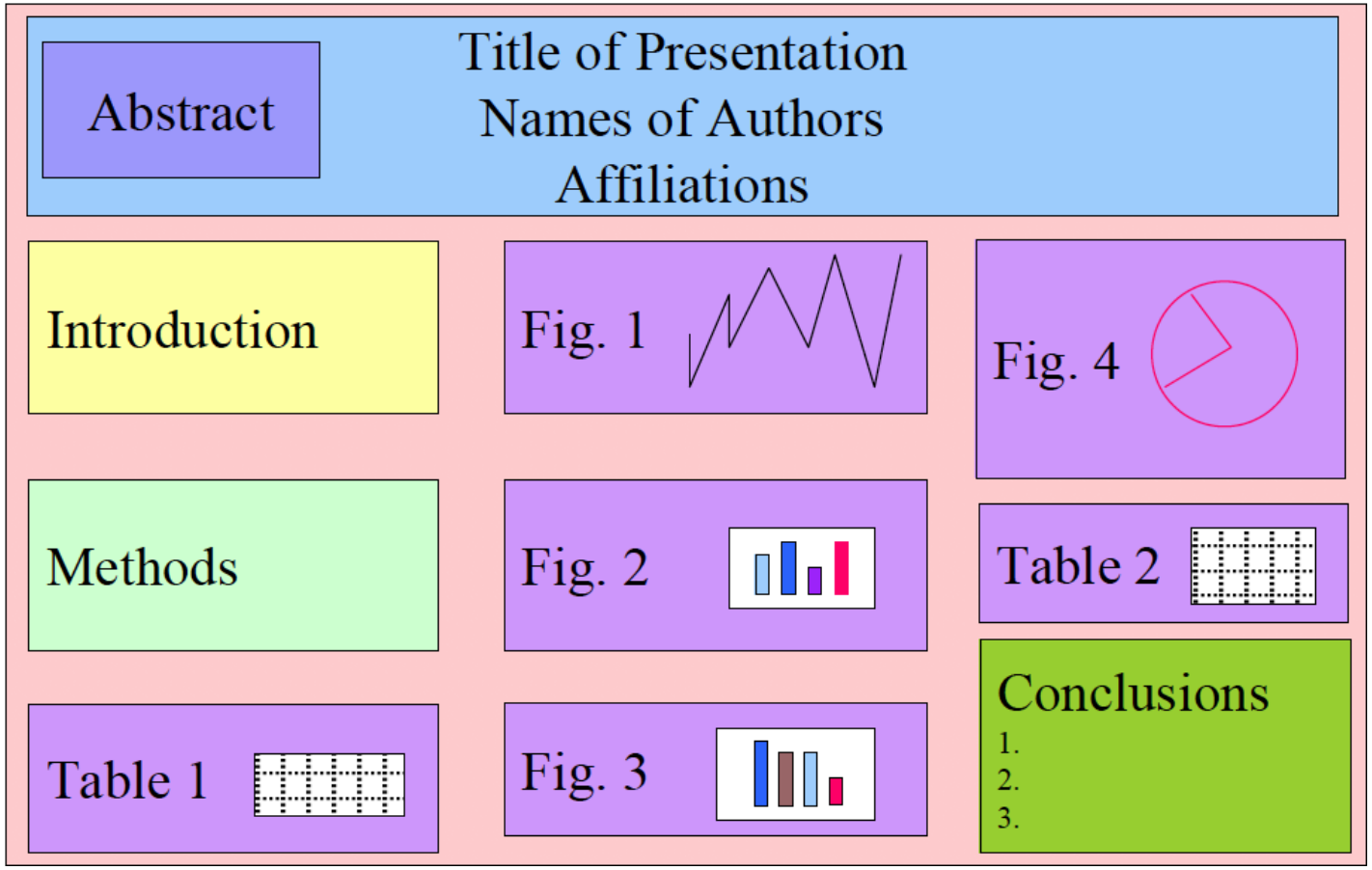
- **Parallelism – Use the same structure in your headings and subheading (e.g. verb).**
- **Coordination – All headings of the same level should be of equal significance.**
- **Subordination - The information in the headings should follow a hierarchical order, according to the level of the headings.**
- **Division - Each heading should be divided into more subheadings..**

Things to avoid

- Do not use colloquial speech, slang, or "childish" words or phrases.
- Do not use contractions: for example, "don't" must be "do not" and "isn't" must be "is not" etc.
- Do not use abbreviations in the text, except for units of measure.
- Use past tense (research papers reflect work that has been completed).
- Do not use first person (i.e., “I (or we) undertook this study …”).

The poster

The poster – a sample



Poster versus paper

Poster	Paper
Text supports images	Images support text
More images	More text – limited images
Emphasis on results	Emphasis on conclusions
Not too much text	Text
Depicts a complicated problem, field research, etc.	Presents a specific topic, method, etc.
Not too much detailed required	Specific employed method required

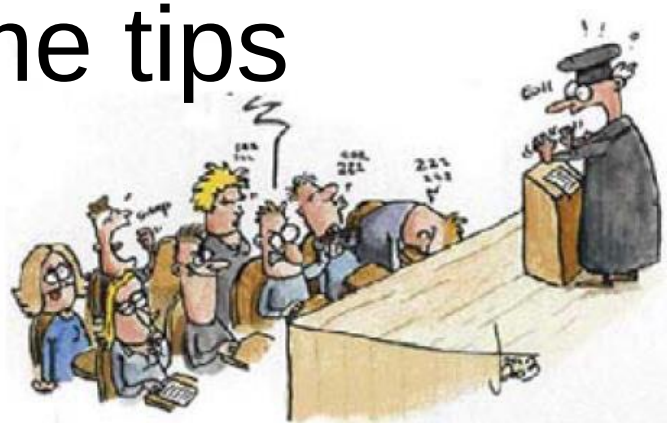
Poster versus oral presentation

- Proximity of creator and audience.
- Detailed visual information.
- More time to review contents.
- Discussion among participants.

Oral presentation

- Presentation of your work.
- Demonstration of your personal abilities.
- Direct evaluation of your work.
- Reception of constructive comments, critique.
- Promotion of your institute to the audience.

Oral presentation – some tips



- “Read” your audience.
- Organize well your material.
- Trigger the audience’s interest.
- Look at your audience.
- Use simple and correct language.
- Connect your description with your material.
- Do not read your material.
- Respect your time.

Oral presentation – some tips

- Be confident!

And do not forget ....

YOU ARE THE EXPERT!!!!

Presenting your research…

- Follow the structure and content of your paper
- Make it interesting avoiding too much text

- Provide codified but understandable messages of your research work
- Use as many figures, tables and diagrams as you can
- Bear in mind the available time:
  - each slide takes approx. 1-1.5 minutes to be presented
  - leave some time for questions

Do not forget to include

- References and correct citations in the body of the paper
- Acknowledgements

Bibliography

- From The Writing Lab & The OWL at Purdue and Purdue University (1995-2011)
- A Guide for Writing Research Papers Based on Modern Language Association (MLA), documentation prepared by the Humanities Department as part of The Guide to Grammar and Writing and the Arthur C. Banks Jr. Library Capital Community College Hartford, Connecticut
- “How to Write a Paper in Scientific Journal Style and Format”, by Bates College: http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWgeneral.html
- “Preparing the scientific paper, or: Confessions of a Journal Editor”, by Alan Stevens
- “A Manual for Writers of Research Papers, Theses, and Dissertations”, Seventh Edition, by Kate L. Turabian

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- “How to Write a BA Thesis, A Practical Guide from Your First Ideas to Your Finished Paper”, by Charles Lipson

Good luck in your scientific and research career!