

Communicating Science through Lightning Talks



ENGINEERING STUDENT
SUCCESS CENTER

Yadéeh Sawyer, Ph.D.

she.her.ella.



Presentations, oh my!

Free Pizza!

2/22
What is the Conference?



3/1
Delivering Presentations



3/8
Developing Presentations



3/22
Data visualization



Tuesdays
11 AM - 12:30 PM
Centennial Library Den2

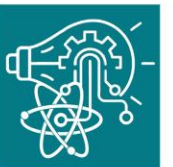
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WIN a gift card*.
GAIN experience.
BUILD your skill set.
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*School of Engineering students only



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YOU
BELONG
HERE

Overview

- The basics
- Constructive feedback
- Oral Presentations
- Additional tips
- Reminders



The Basics

Ann Smith

Accounting Student

Phone 774-987-4008
E-mail a.smith@uptowork.com
WWW cv.uptowork.com/a.smith
in www.linkedin.com/annutw

1905 W Northern Ave
Phoenix, AZ 85021

I thrive on **challenges and ambitious goals**. My greatest strength is the ability to combine my **analytical skills** with well-developed **interpersonal skills**. I can build and maintain **high-quality business relationships**. I am a committed and enthusiastic candidate seeking to become a Finance Management Trainee in an international consulting company.

Education

2015-09 - present International Finance and Accounting / Arizona State University / Master's Studies
2011-09 - 2015-05 Accounting / Arizona State University / Bachelor of Science in Accounting
Minor in Asian Languages (Chinese)

Experience

2015-08 - 2015-09 Intern
Accounting Firm Ltd / Phoenix, AZ, USA
• Analyzed and approved project expenses.
• Processed expenditure data.
• Cooperated with management.
• Provided administrative support.

2015-07 - 2015-08 Trainee
Construction Office / Phoenix, AZ, USA
• Analyzed construction projects costs.
• Was responsible for contact with B2B contractors.
• Created databases.

Additional Activities

2012-10 - 2015-05 Eastern Relations Student Research Club, Arizona State University
• Organized specialized events.
• Built positive relations with content partners.
• Managed external contacts.

Languages

Chinese  *Advanced*
Spanish  *Basic*

Key Skills

Financial Analysis
Market Analysis
Interpersonal Relationship Building
Working in an International Environment
Special Event Organization
Preparation of Offers and Presentations
Advanced Command of MS Excel

Ann Smith

Phoenix, AZ, Phoenix Phone 774-987-4009 E-mail a.smith@uptowork.com in www.linkedin.com/annutw

Phoenix, 2016-05-17

Benjamin Thomson
CEO
Thomson and Thomson
1140 Main Street
IL 60605 Chicago

Dear Mr Thomson

I am writing to enquire if you have any vacancies in your company. I enclose my CV for your information.

As you can see, I have had extensive vacation work experience in office environments, the retail sector and service industries, giving me varied skills and the ability to work with many different types of people. I believe I could fit easily into your team.

I am a conscientious person who works hard and pays attention to detail. I'm flexible, quick to pick up new skills and eager to learn from others. I also have lots of ideas and enthusiasm. I'm keen to work for a company with a great reputation and high profile like Thomson and Thomson.

My most achievements include:

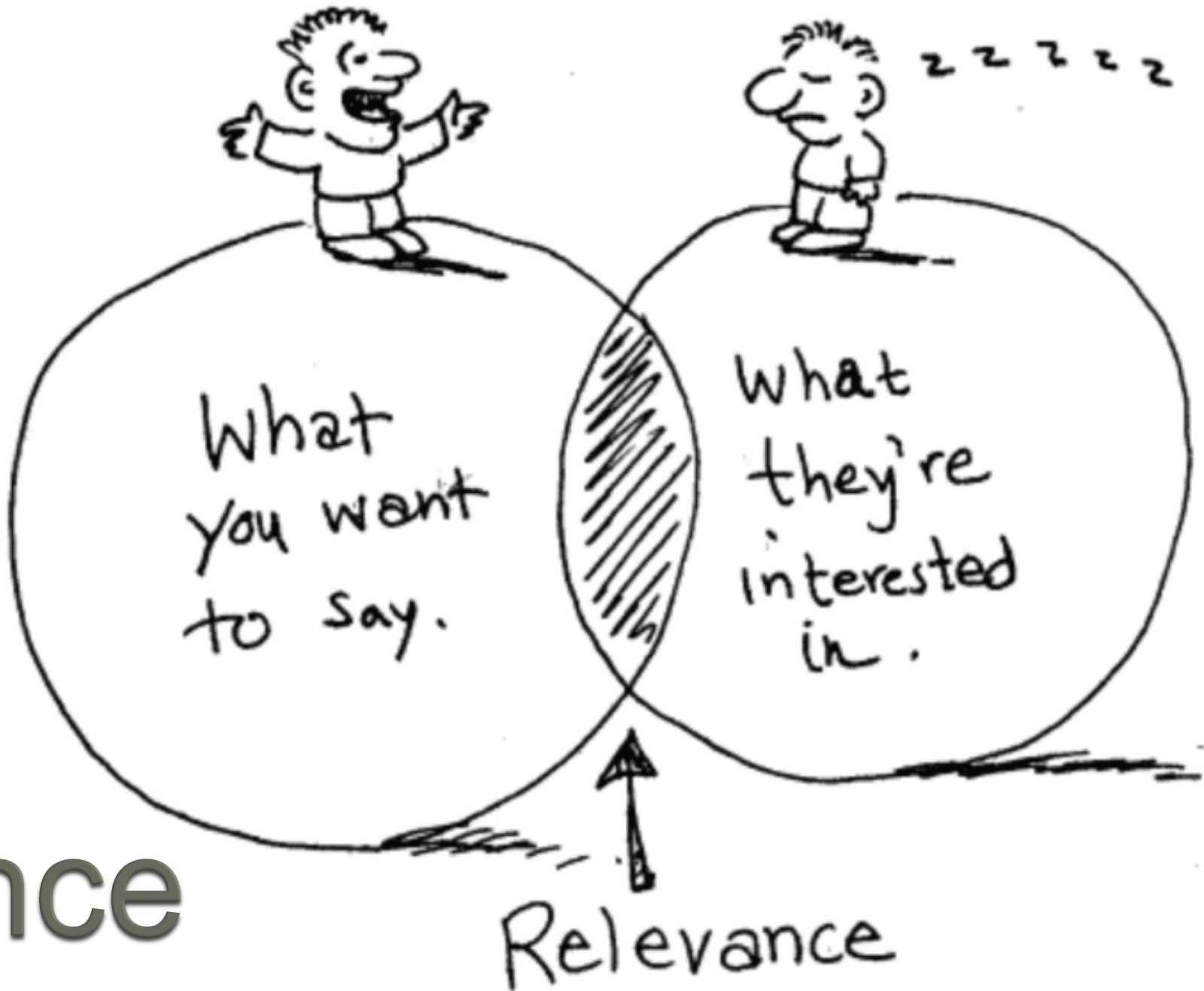
• Implementing new customer relations strategy that yielded a department client retention rate of 97%
• Increasing regional sales revenue from \$70k to \$100k by developing more efficient meeting and sales process

I have excellent references and would be delighted to discuss any possible vacancy with you at your convenience. In case you do not have any suitable openings at the moment, I would be grateful if you would keep my CV on file for any future possibilities.

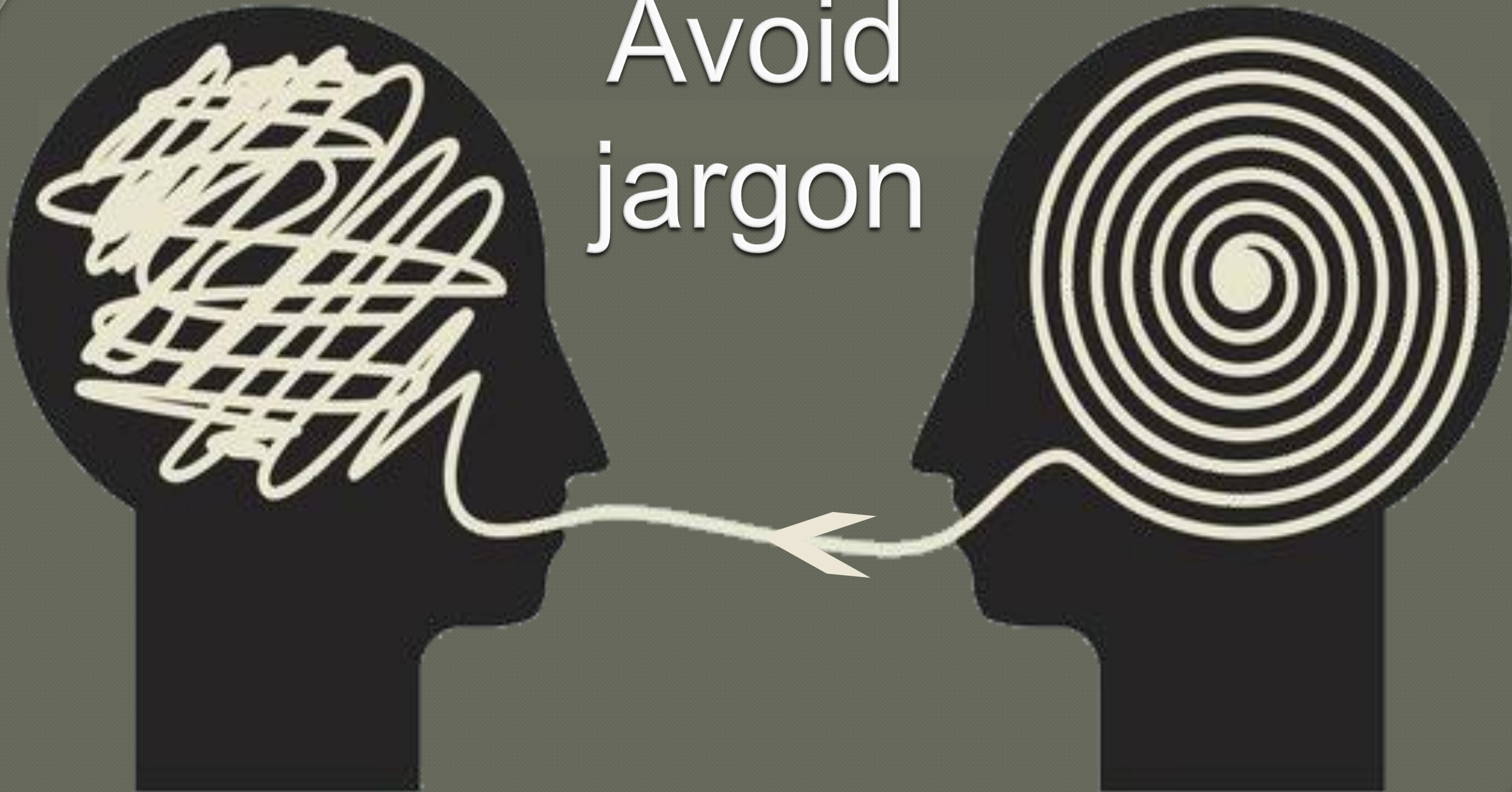
Yours sincerely
Ann Smith

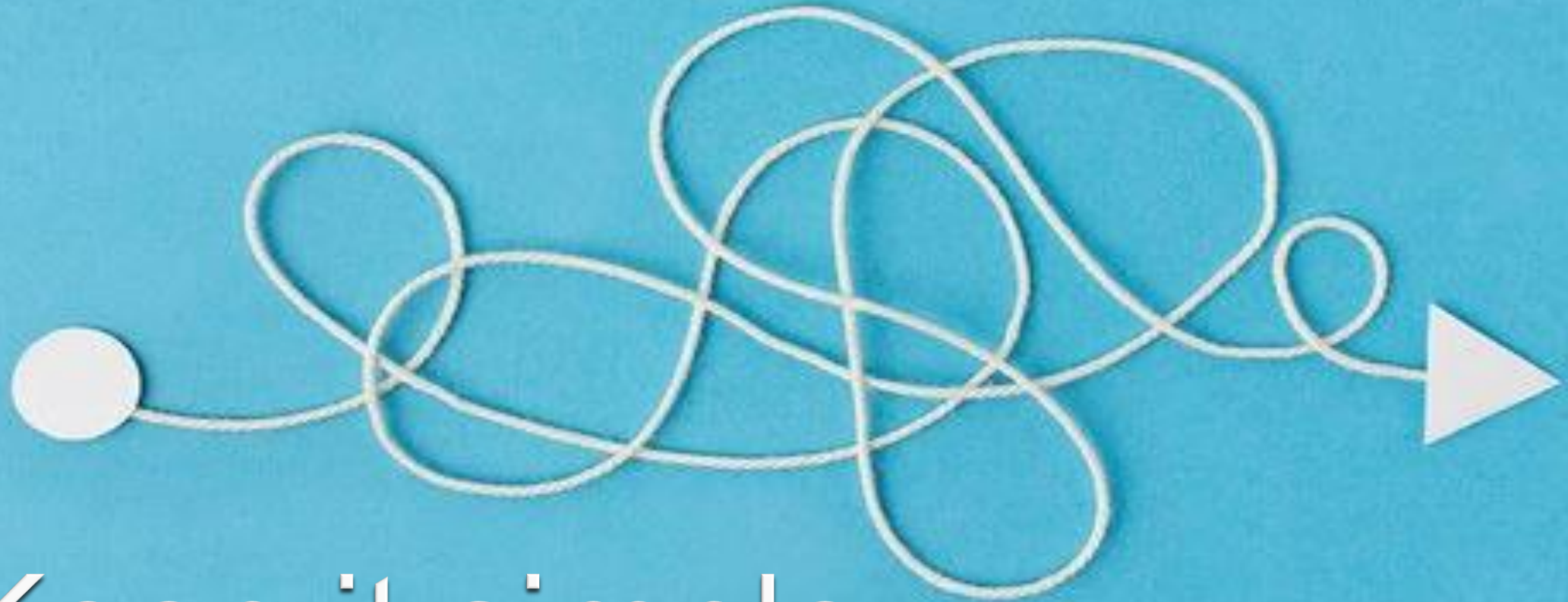


Know your audience



Avoid
jargon





Keep it simple



The 3 P's



A rectangular wooden sign with a dark border and a chain hanging from the top. The sign is painted yellow and has the words "PLAN AHEAD" written in large, dark blue, hand-painted capital letters. The word "D." is written on a second line, aligned with the end of "AHEAD".

PLAN AHEAD
D.

www.angelaterris.com

PRACTICE

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3 TIMES

1st - Content

2nd - Time

3rd - Polish

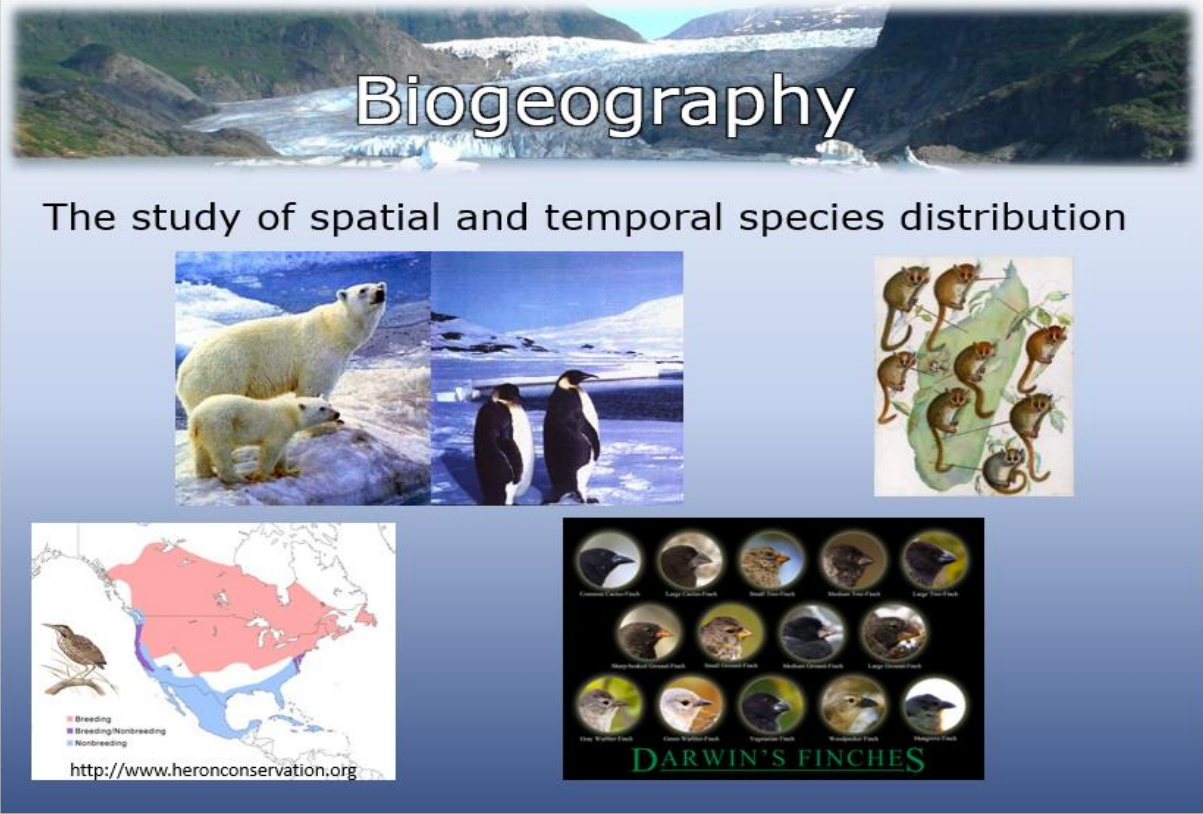
BrownBagS2013_final - PowerPoint Yadeeh Sawyer - she.her.ella

File Home Insert Draw Design Transitions Animations Slide Show Review View Help Acrobat Tell me what you want to do Share

Clipboard Slides Font Paragraph Drawing Editing Create and Share Adobe PDF Adobe Acrobat

Biogeography

The study of spatial and temporal species distribution



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Biogeographers are interested in why species exist where they do, both contemporarily and historically. For example, why do Polar Bears exist in the Arctic and Penguins in the Antarctic, or how does reproductive status affect the range of the North American Bittern.

Especially intriguing questions surround organisms on islands, either within a single island, like the diversification of Lemurs across Madagascar, or across an island system, as is the example of Darwin's Finches in the Galapagos. It was thought that the ancestral population was in Ecuador, due to geographic proximity, however, once studies looked at historic continental location, and changes in the ocean currents and prevailing winds, they concluded the source to be in the Caribbean. This shows how dynamic islands can be and highlights the importance of including geographic and climatic history in phylogeographic studies.

For island systems...

Slide 5 of 66

Notes Comments 86%

* PRACTICE *

~~Makes PERFECT.~~ *

* Makes **PROGRESS.**

* Brings understanding of what **WORKS** and what doesn't work.

* UPs your **SKILL** level.

* Creates new **HABITS**.

* Builds **CONFIDENCE**.

Dress appropriately



Streetwear



Casual



Business
Casual



Smart
Casual



Business /
Informal



Black Tie /
Semi-Formal

Constructive Feedback/Criticism



“Good job” and “You’re not a team player” aren’t feedback.



Be specific.
No example. No feedback.



Receiving feedback



The image features six white, stylized masks arranged in two rows of three. Each mask displays a different facial expression: the top row shows sadness, surprise, and happiness; the bottom row shows anger, disgust, and fear. A central text box is overlaid on the masks.

Stop your 1st reaction



BETTER

THINGS

MAKE

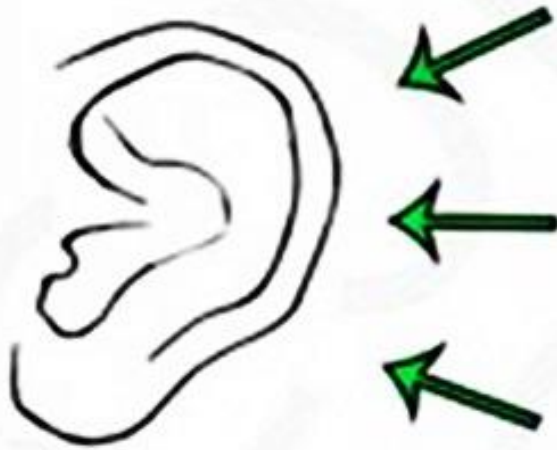
Focus on the
benefit



Focus on understanding

HEAR

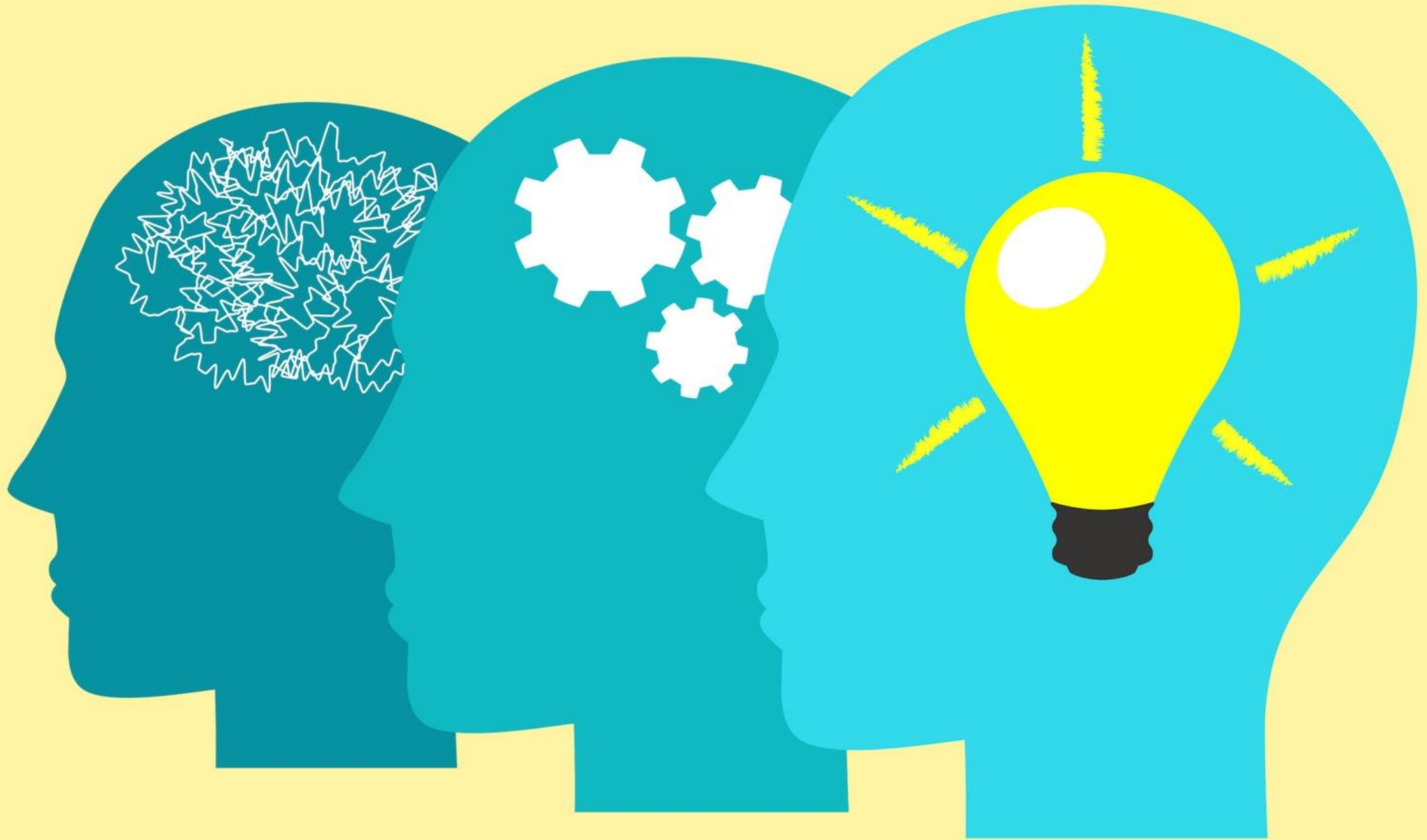
A sound/noise comes into your ear without you making an effort.



LISTEN

When you pay attention and try to listen to sounds.







**Ask
Questions**

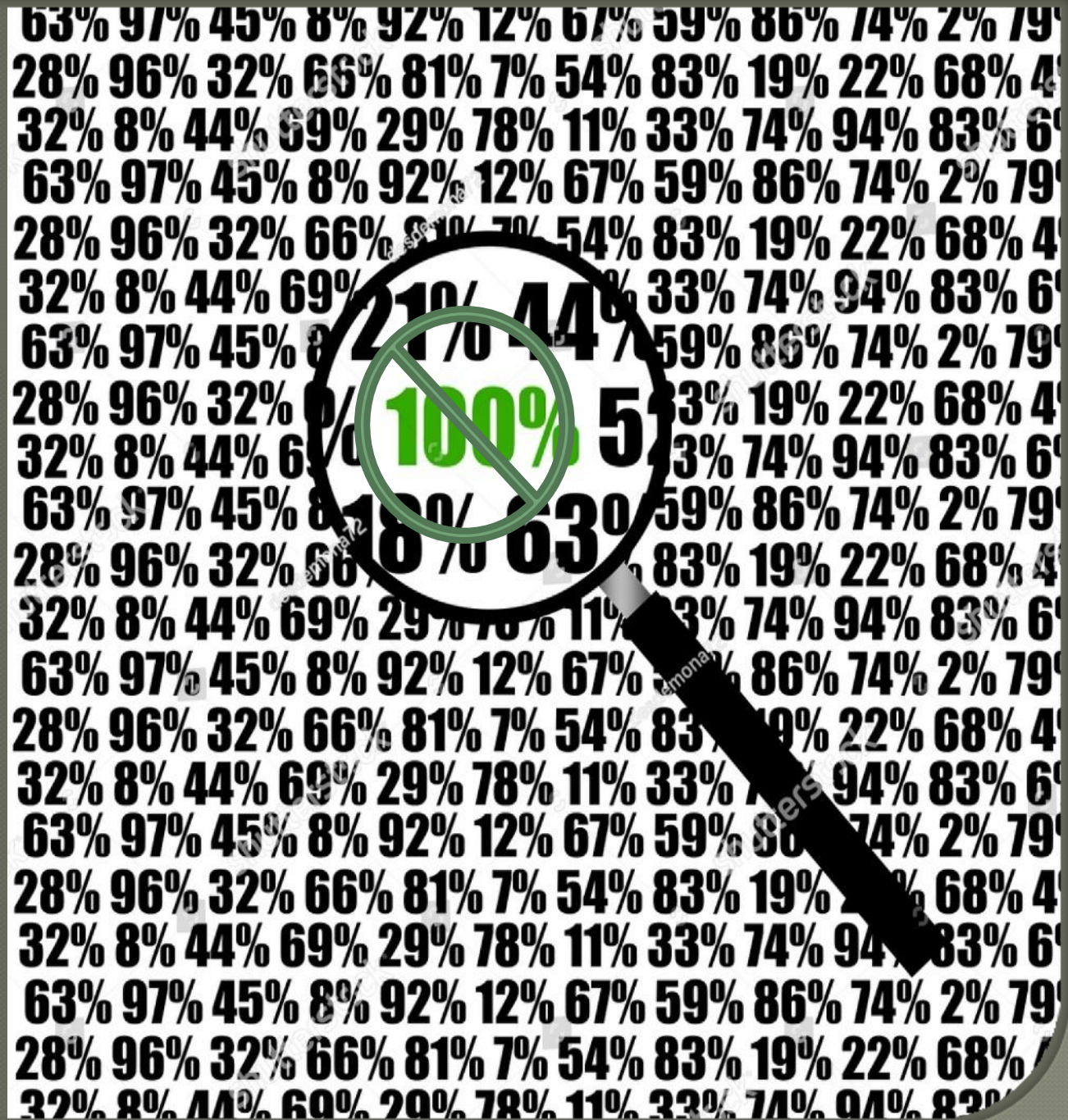
Turn Dread into Joy






You Belong

You are not
expected to
be perfect





A silhouette of a person standing on a dark, rounded peak, celebrating with their right arm raised high and their left hand clenched in a fist. The background is a bright blue sky with a large, glowing sun or moon partially obscured by a faint rainbow. The lower portion of the image is filled with soft, white and yellowish clouds. The entire scene is framed by a dark border with rounded corners.

The
audience
is rooting
for you



Storytelling is key





Oral Presentations

The Bad...



Charles Darwin and NATURAL SELECTION

- **Charles Robert Darwin FRS** (12 February 1809 – 19 April 1882) was an **English naturalist**.^[1] He established that all **species** of life have descended over time from **common ancestry**, and proposed the **scientific theory** that this **branching pattern** of **evolution** resulted from a process that he called **natural selection**.
- He published his theory with compelling evidence for evolution in his 1859 book *On the Origin of Species*.^{[1][2]} The **scientific community** and much of the general public came to accept **evolution as a fact** in his lifetime.^[3] However, it was not until the emergence of the **modern evolutionary synthesis** from the 1930s to the 1950s that a broad consensus developed that natural selection was the basic mechanism of evolution.^[4] In modified form, Darwin's scientific discovery is the unifying theory of the **life sciences**, explaining the **diversity of life**.^{[5][6]}
- Darwin's early interest in nature led him to neglect his **medical education** at the **University of Edinburgh**; instead, he helped to investigate **marine invertebrates**. Studies at the **University of Cambridge** encouraged his passion for **natural science**.^[7] His **five-year voyage** on **HMS Beagle** established him as an eminent **geologist** whose observations and theories supported **Charles Lyell's uniformitarian** ideas, and publication of his **journal of the voyage** made him famous as a popular author.^[8]
- Puzzled by the geographical distribution of wildlife and **fossils** he collected on the voyage, Darwin investigated the **transmutation of species** and conceived his theory of natural selection in 1838.^[9] Although he discussed his ideas with several naturalists, he needed time for extensive research and his geological work had priority.^[10] He was writing up his theory in 1858 when **Alfred Russel Wallace** sent him an essay which described the same idea, prompting immediate joint publication of **both of their theories**.^[11] Darwin's work established evolutionary descent with modification as the dominant scientific explanation of diversification in nature.^[12] In 1871, he examined **human evolution** and **sexual selection** in *The Descent of Man, and Selection in Relation to Sex*, followed by *The Expression of the Emotions in Man and Animals*. His research on plants was published in a series of books, and in his final book, he examined **earthworms** and their effect on soil.^[12]
- In recognition of Darwin's pre-eminence as a scientist, he was one of only five nineteenth-century non-royal personages from the United Kingdom to be honoured by a **state funeral**,^[13] and was buried in **Westminster Abbey**, close to **John Herschel** and **Isaac Newton**.^[14]

-
- ◉ As a boy in England, he had an interest in nature. His father wanted him to be a doctor, but he did not want to. He dropped out of medical school at the age of 17 to become a naturalist (biologist). When he was 22, he went on a voyage to the Galapagos Islands. They began in Great Britain, and skirted around South America. Darwin closely observed the flora and fauna of S.A. on the way to the islands. On this trip to the Galapagos Islands in 1831, Darwin came up with the idea of natural selection. He saw there were many types of not only finches but tortoises too, each having its own niche, he wondered if each of these were a different species or just variation within the finch and tortoise population. He hypothesized that each type of finch and each type of tortoise, had adaptations to their particular environment (each island has its own unique environmental conditions) and this eventually lead to the emergence of a new species. These hypotheses along with his observations lead him to write a book describing the process of natural selection. There are 4 main points to the theory of **natural selection**:

Evolution

- Evolution:

- Is change over time.
- Evolution does not have a goal; it is shaped by natural selection

- **Species:**

- **an interbreeding population of organisms that can produce healthy, fertile offspring. If evolutionary changes are so large, it may not allow for the is interbreeding.**

- *Structure:*

- *Scientists use structure and fossils to help them determined the degree of relatedness, how closely related two species are. They do this through the examination of fossils and the anatomy of species present today, and are able to stipulate as to how long ago they share a common ancestor.*

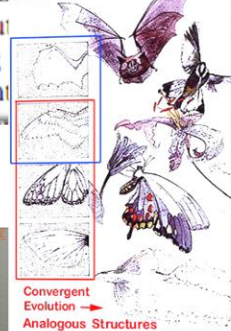
DO 'VESTIGIAL ORGANS' PROVIDE EVIDENCE FOR EVOLUTION?

S.R. Scadding
 Department of Zoology
 University of Guelph
 Guelph, Ontario, Canada N1G 2W1
 Received August 14, 1980; March 9, 1981

ABSTRACT: The existence of functionless 'vestigial organs' was presented by Darwin, and is often cited by current biology textbooks, as part of the evidence for evolution. This paper examines the origin and nature of this argument tracing it to the works of Darwin, Haeckel, and particularly Wiedersheim. An analysis of the difficulties in unambiguously identifying functionless structures and an analysis of the nature of the argument, leads to the conclusion that 'vestigial organs' provide no evidence for evolutionary theory.

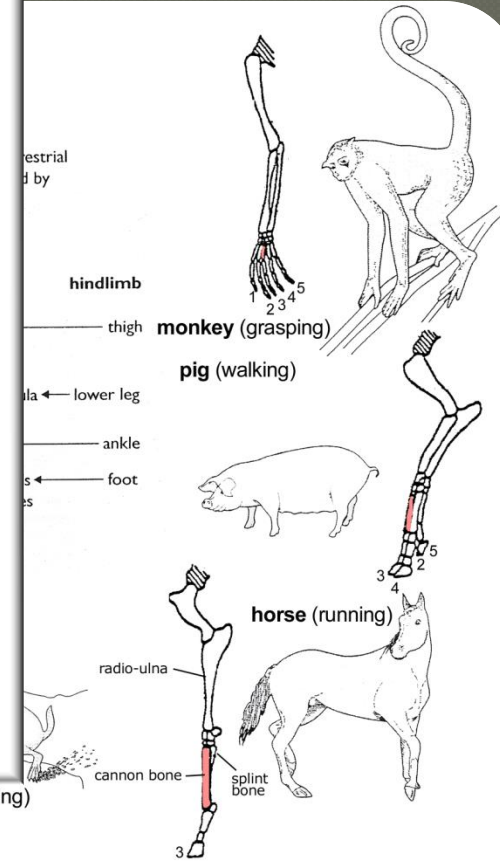
In almost all biology textbooks that discuss the "evidence for evolution", vestigial organs are cited as one piece of evidence that supports evolutionary theory (Johnson et al. 1972; Kimball 1974; Moody 1970; Stephens and North 1974; Taylor and Weber 1968; Vilee and Dethier 1971). The argument is usually presented in the following manner. Virtually all animals possess organs or structures that have no function. These are homologous to organs or structures that are functional in other related animals. Consequently, these vestigial organs are interpreted as organs that, having lost their usefulness, are in a process of evolutionary decay and can be expected to be eliminated during the course of future evolution. Thus, they provide evidence for the theory of evolution, i.e. that the animal possessing the vestigial structure is a descendant of an animal that possessed the homologous structure in a functional condition. Examples of vestigial structures are given, usually for humans but sometimes with examples from other animals or plants. Vestigial organs identified in the human typically include the vermiform appendix, coccyx, ear muscles, semilunar fold of the eye, and occasionally others. Some textbooks claim that there are over one hundred vestigial structures in the human body, but more than five or six (Stephens and North 1974; Taylor and Weber 1968; 1971). It is the purpose of this paper to review and evaluate this argument.

anteater (tearing)



mole (digging)

Evolution



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MOVE QUICKLY IN THE WATER, BUT IT HAS EVOLVED
NOT INHERITED FROM A COMMON ANCESTOR.

Natchural Selection

- There is variation within a population. Variations within a species are what allow the process of evolution to occur. Some of these differences are physical and some are chemical, some are large and some are small, but they non-the less allow for evolution, and natural selection to take place.
- Some variations are favorable, they lead to the increased success of the population
- Not all young produced in each generation can survive, many will die from starvation, disease or predation
- Individuals that survive and reproduce are those with favorable variations – survival of the fittest



PEppered Moth game

Peppered Moth Game

Peppered Moth

Natural Selection

Dr. Kettlewell

How to Play

Play Game

Choose a forest for your experiment



Light Forest



Dark Forest

<https://askabiologist.asu.edu/peppered-moths-game/play.html>

TABLE 13.3 Rates of chromosomal evolution vary substantially between groups

Group	No. of Genera Examined	Average Age of Genera	Net Chromosomal Changes per Myr
Placental mammals			
Rodents	42	4.6	17.8
Primates	12	4.4	14.2
Rabbits	3	9.0	12.8
Ungulates	14	4.3	11.5
Insectivores and			
edentates	8	11.0	6.5
Carnivores	11	11.6	4.5
Bats	17	10.7	3.3
Whales	3	6.3	1.7
Average	—	7.7	9.1
Other vertebrates			
Marsupials	8	1.9	1.3
Snakes	12	12.4	2.6
Lizards	15	23.0	2.4
Turtles and			
crocodiles	13	51.0	2.21
Frogs	12	16.7	1.8
Salamanders	9	21.5	0.6
Teleost fishes	23	18.8	2.6
Average	—	20.6	1.7
Mollusks			
Prosobranch snails	16	64.7	0.3
Other snails	15	49.0	0.4
Bivalves	3	77.0	0.1
Average	—	64.0	0.3

Adapted from Wilson A.C. et al. 1975. *Proc. Natl. Acad. Sci.* 72: 5061–5065 (©1975 Wilson et al.). Myr, millions of years.

The End

Discuss the Bad



The Good...

Chlorine Batch Generator

Sponsor: Rodney Herrington

Technical Mentor: Tim Cushman

Project Manager: Carlos D. Escobedo

Wireless Communication: Jorge Morales



Origins to the Diversity of Life

Yadéeeh Sawyer, Ph. D.

she/her/ella

University of New Mexico

Overview

- Evolution
- Charles Darwin
- Natural Selection
- Species
- Rate of Evolution
- Structures

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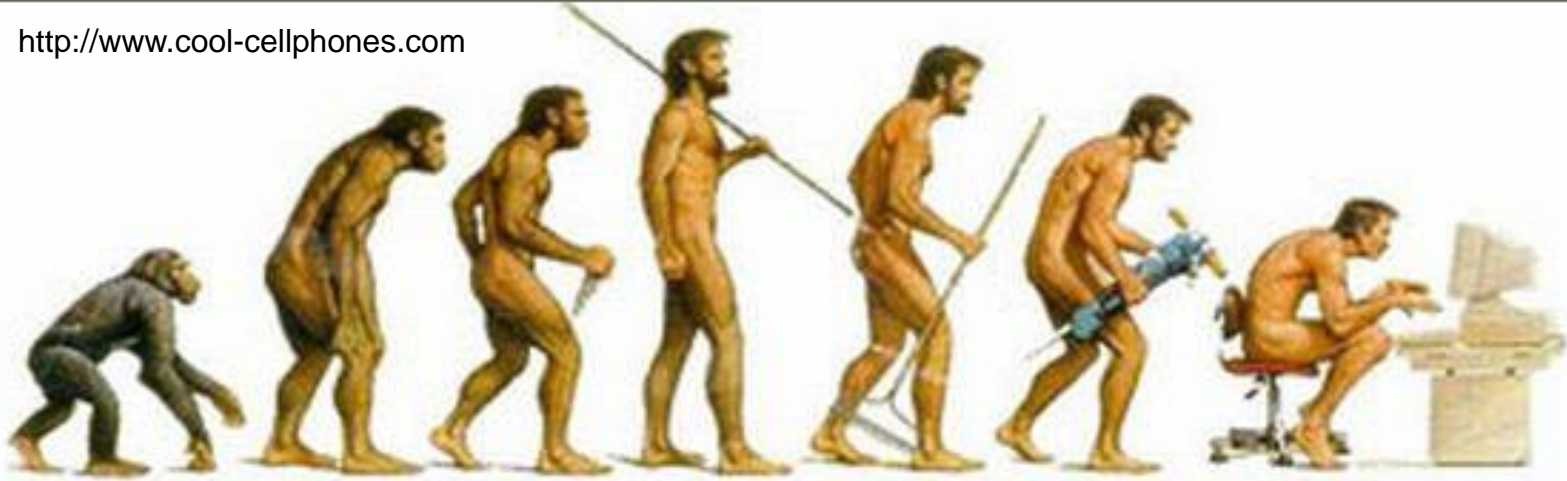
Evolution

- Change over time



Evolution





Change over time



Evolution

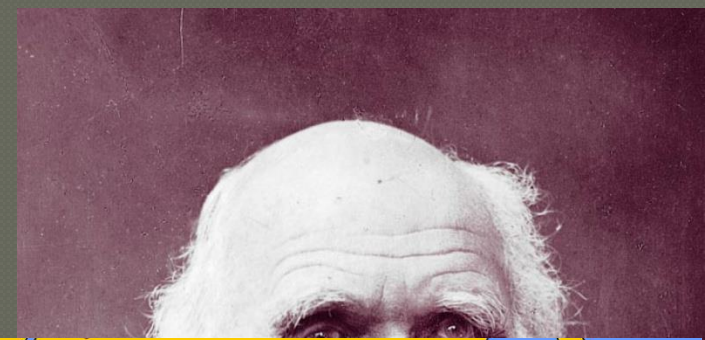
- No Goal
- Natural Selection



No goal

Charles Darwin

- English
- Naturalist
- The Beagle
- Natural Selection

A composite image featuring a map of Darwin's voyage on the HMS Beagle and six photographs of finch species. The map shows the route from Plymouth, England, to the Galapagos Islands, then to Callao-Lima and Valparaiso in South America. The finch species shown are: small ground finch, medium ground finch, large ground finch, sharp-beaked ground finch, cactus finch, and large cactus finch.

Plymouth

Galapagos

Callao - Lima

Valparaiso

small ground finch

medium ground finch

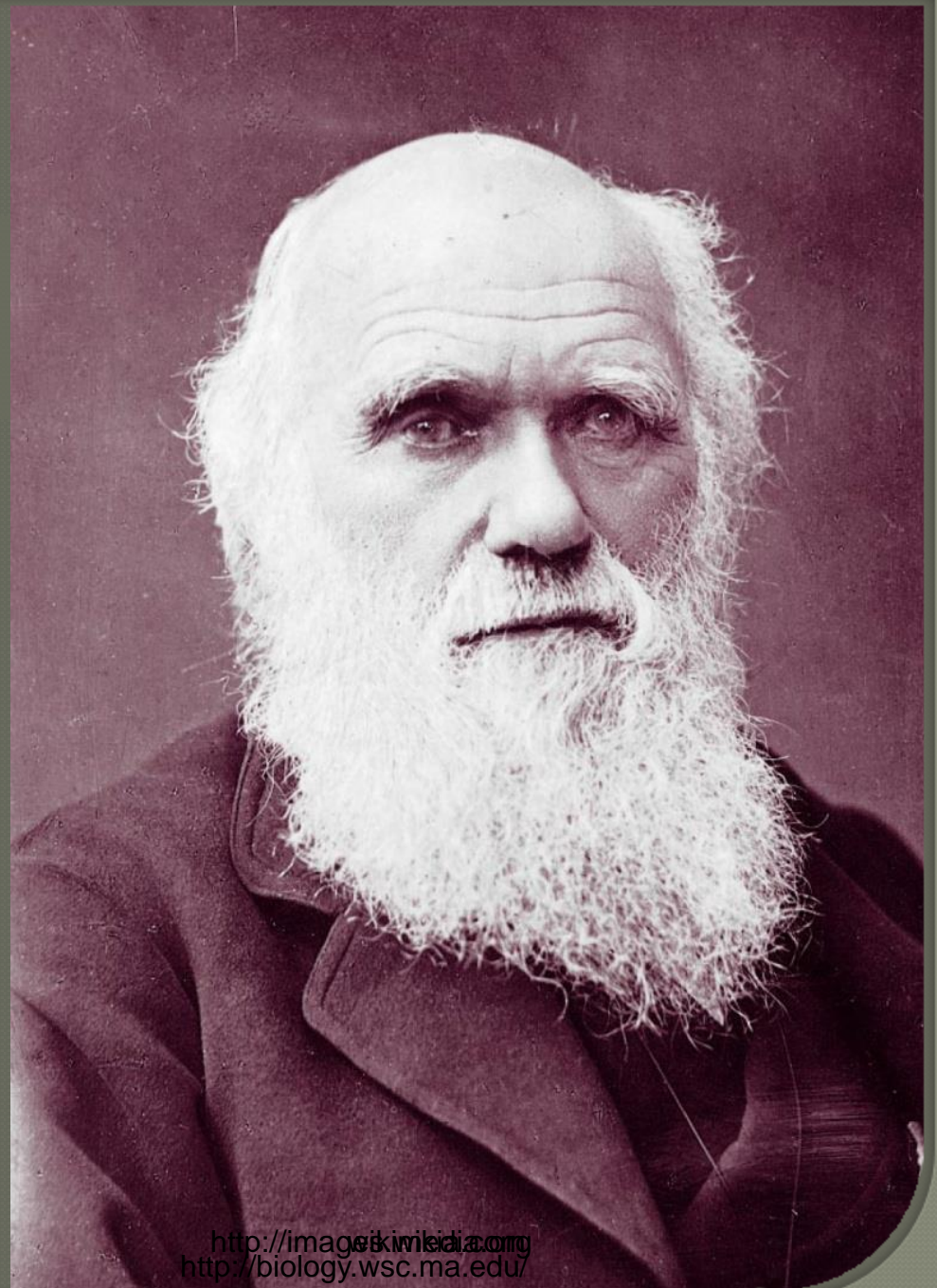
large ground finch

sharp-beaked ground finch

cactus finch

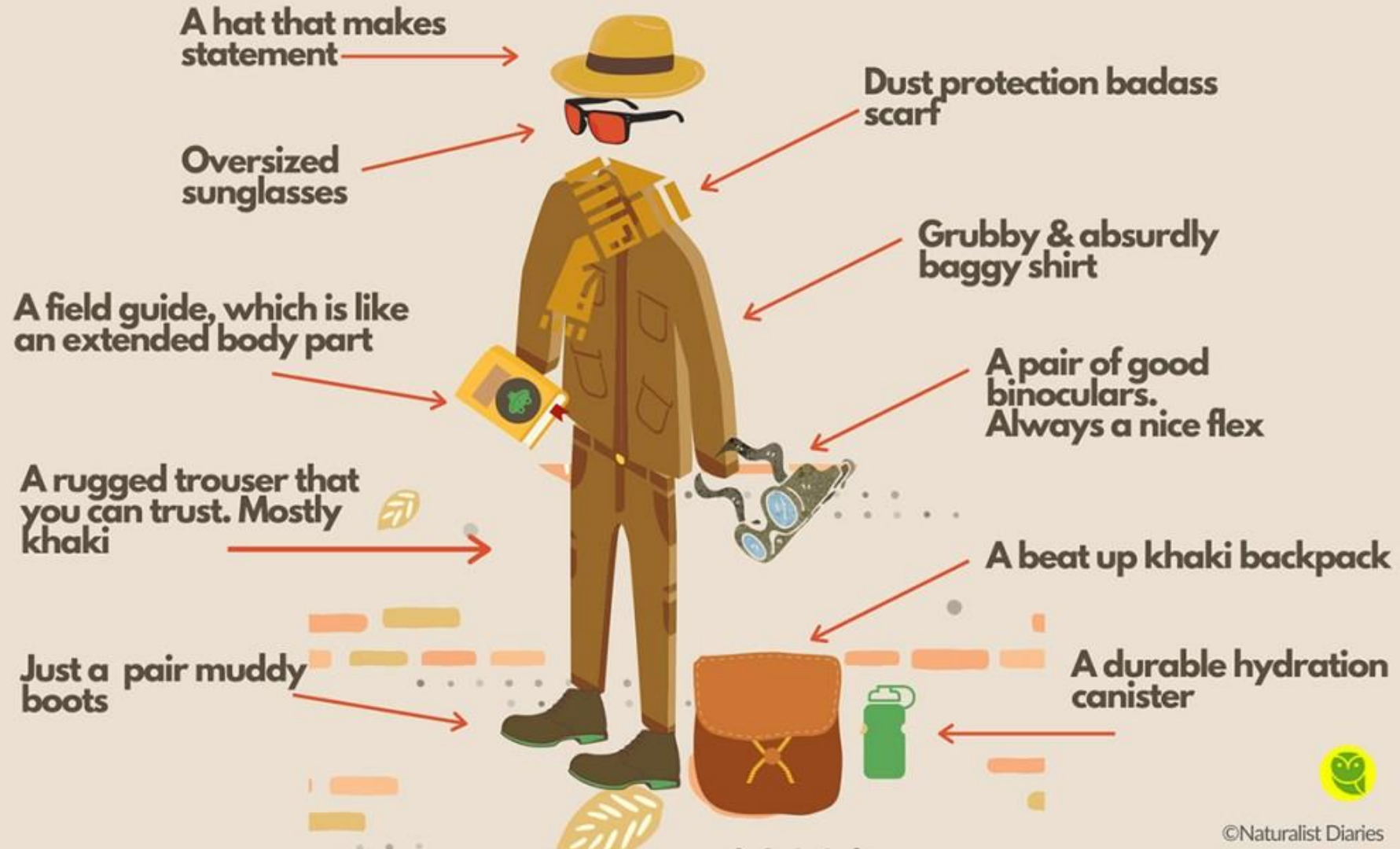
large cactus finch

Charles Darwin



<http://image.wikia.org>
<http://biology.wsc.ma.edu/>

ANATOMY OF A NATURALIST



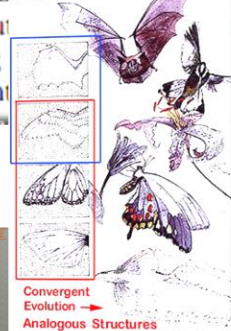
DO 'VESTIGIAL ORGANS' PROVIDE EVIDENCE FOR EVOLUTION?

S.R. Scadding
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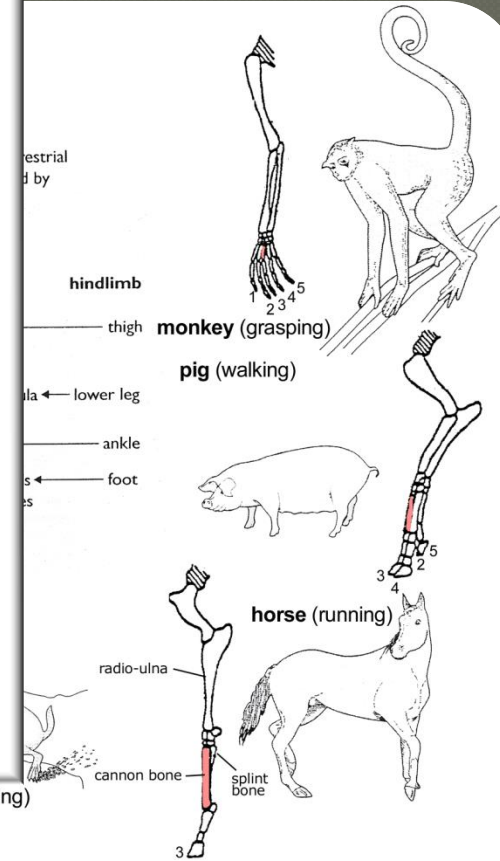
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mole (digging)

Evolution



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PEppered Moth game

Peppered Moth Game

Peppered Moth

Natural Selection

Dr. Kettlewell

How to Play

Play Game

Choose a forest for your experiment



Light Forest



Dark Forest

<https://askabiologist.asu.edu/peppered-moths-game/play.html>

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Average	—	7.7	9.1
Other vertebrates			
Marsupials	8	1.9	1.3
Snakes	12	12.4	2.6
Lizards	15	23.0	2.4
Turtles and			
crocodiles	13	51.0	2.21
Frogs	12	16.7	1.8
Salamanders	9	21.5	0.6
Teleost fishes	23	18.8	2.6
Average	—	20.6	1.7
Mollusks			
Prosobranch snails	16	64.7	0.3
Other snails	15	49.0	0.4
Bivalves	3	77.0	0.1
Average	—	64.0	0.3

Adapted from Wilson A.C. et al. 1975. *Proc. Natl. Acad. Sci.* 72: 5061–5065 (©1975 Wilson et al.). Myr, millions of years.

The End

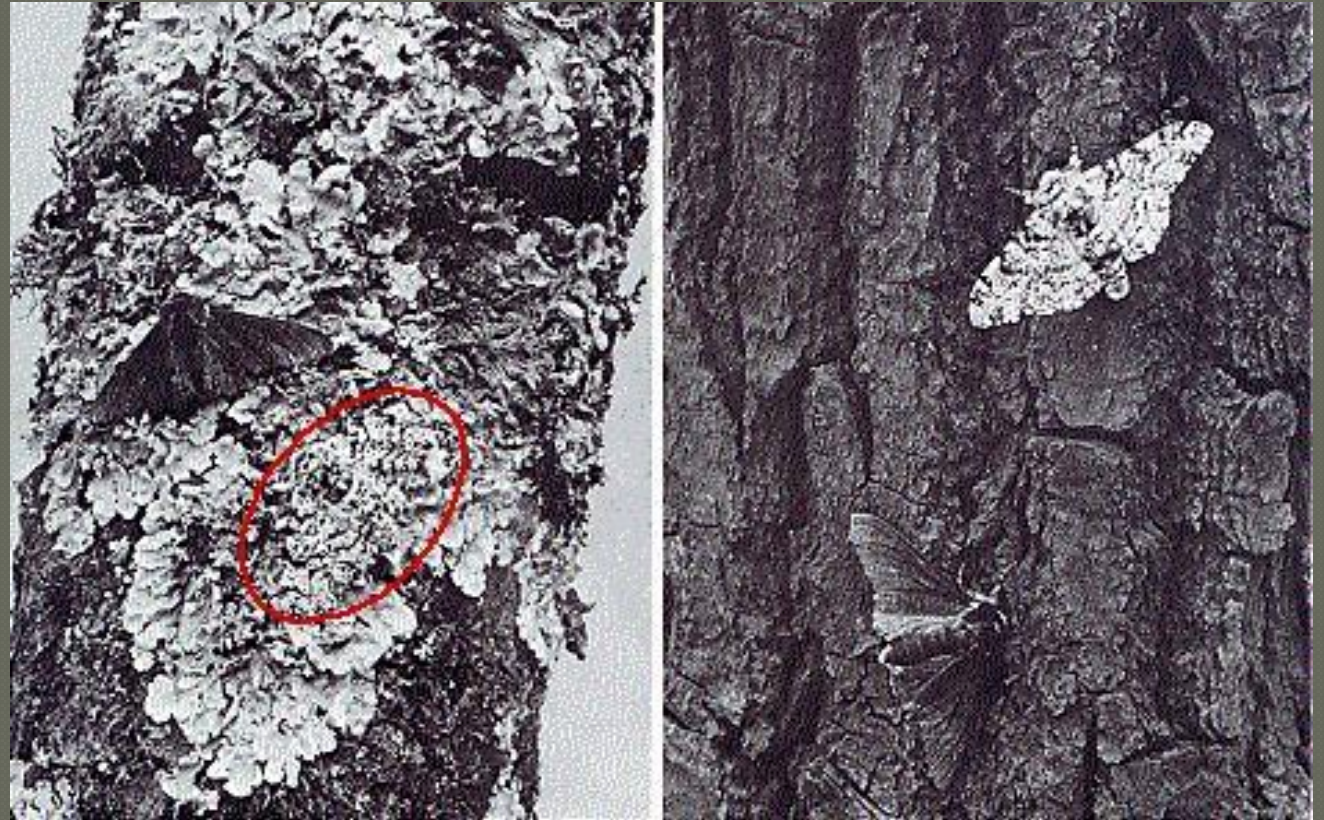
Natural Selection

- 1) Variation



Natural Selection

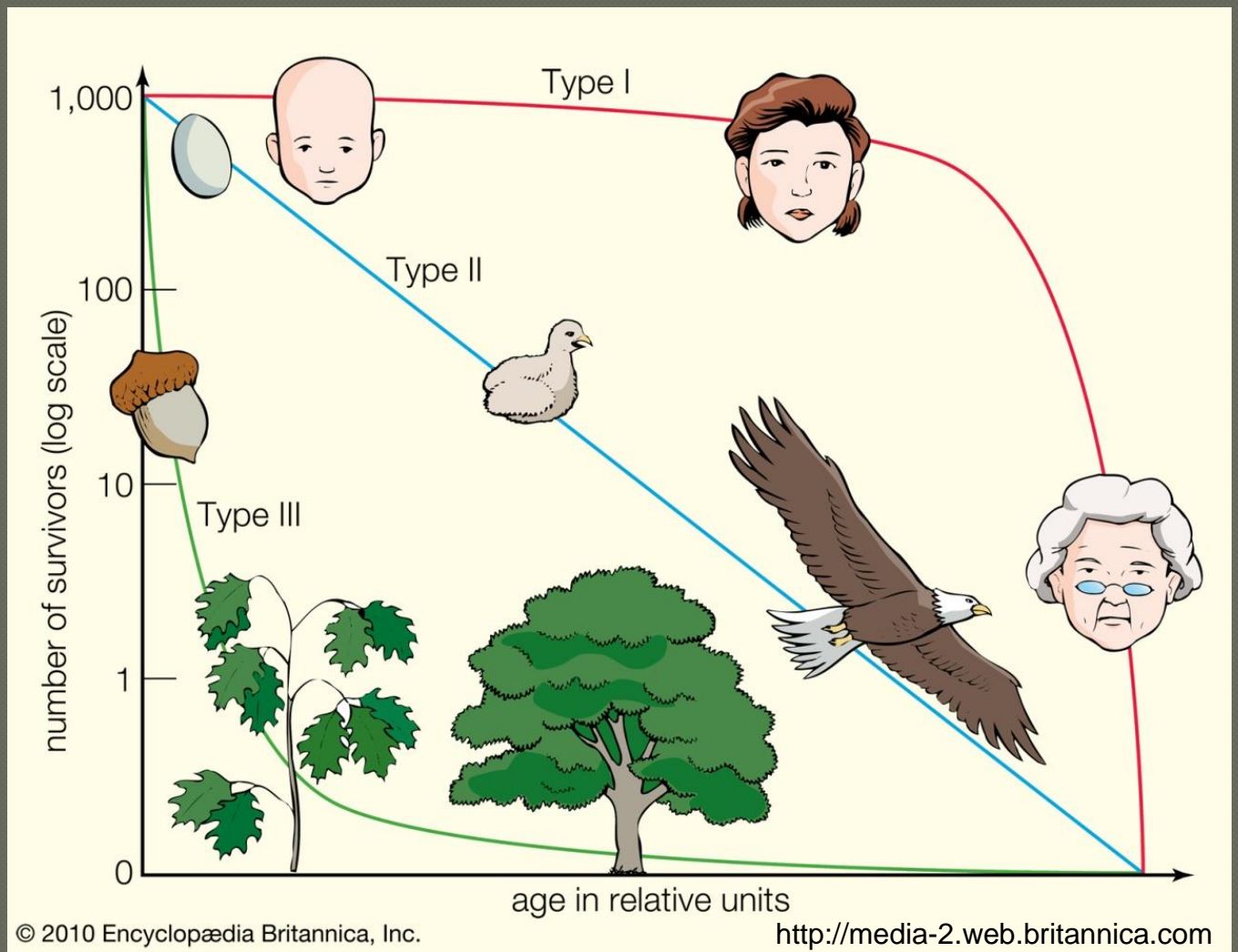
- 2) Favorable conditions



<http://www.expelledexposed.com/>

Natural Selection

3) Death

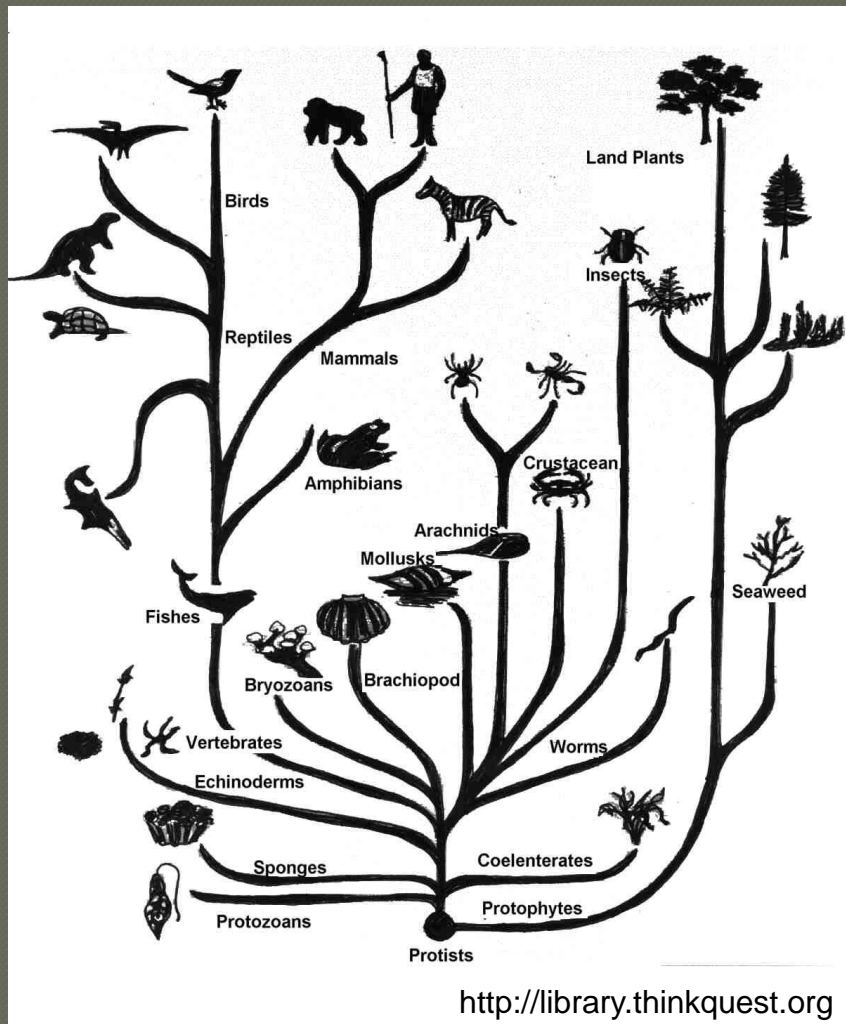


Natural Selection

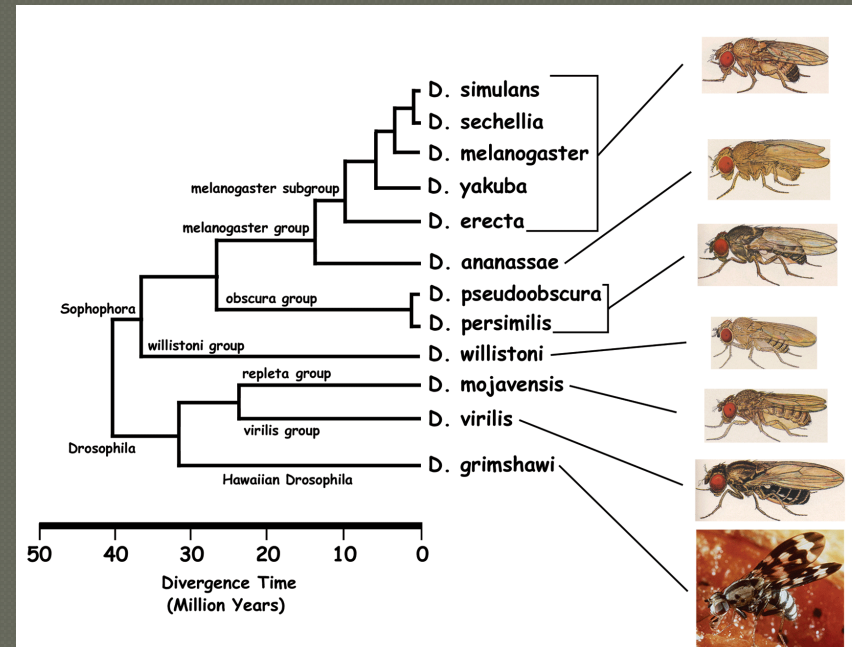
- 4) Survival of the fittest



Species



<http://library.thinkquest.org>



<http://insects.eugenes.org>

Rate of Evolution

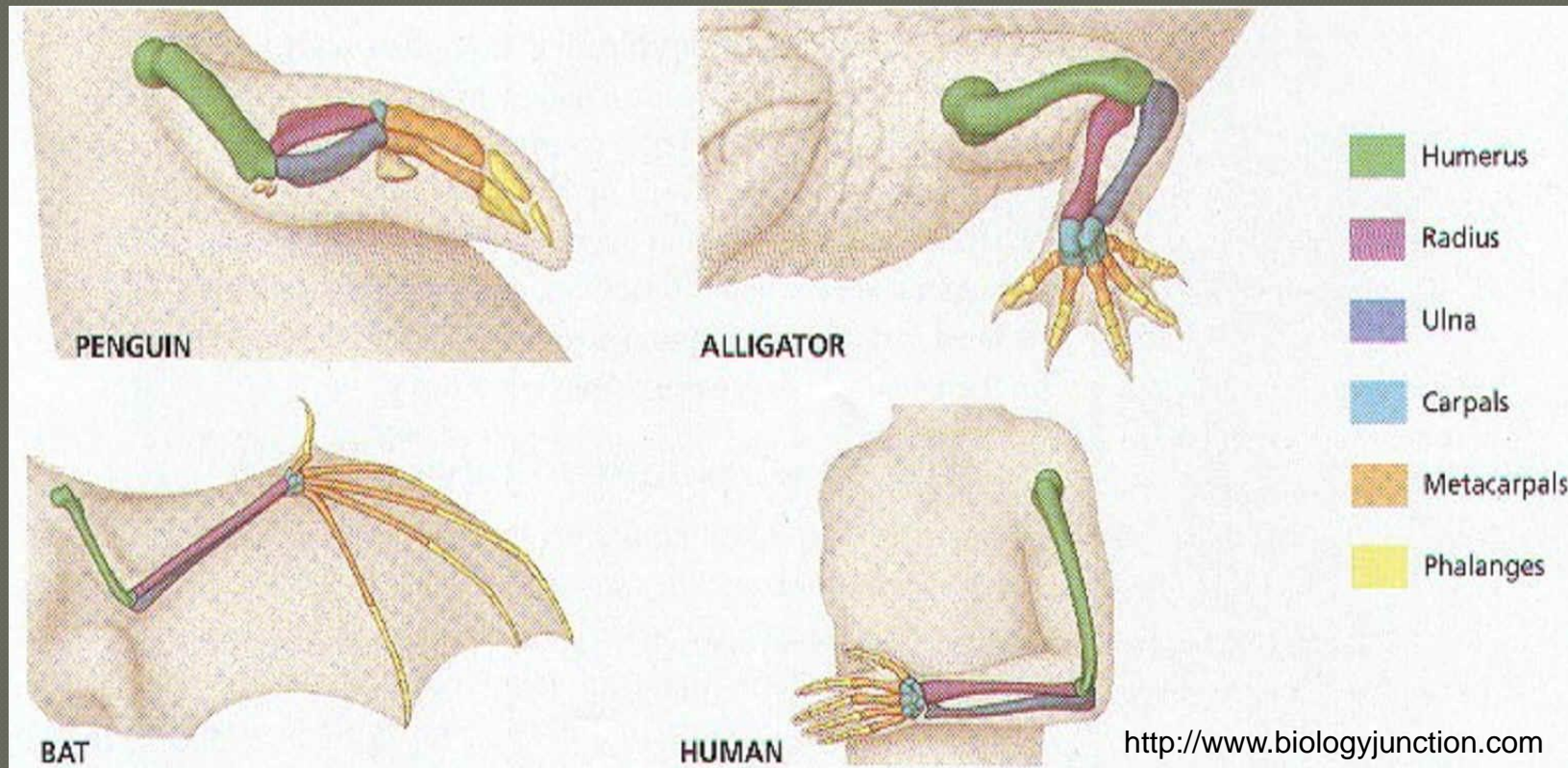
TABLE 13.3 Rates of chromosomal evolution vary substantially between groups

Group	No. of Genera Examined	Average Age of Genera	Net Chromosomal Changes per Myr
Placental mammals Average	—	7.7	9.1
Other vertebrates Average	—	20.6	1.7
Mollusks Average	—	64.0	0.3

Adapted from Wilson A.C. et al. 1975. *Proc. Natl. Acad. Sci.* **72**: 5061–5065 (©1975 Wilson et al.).
Myr, millions of years.

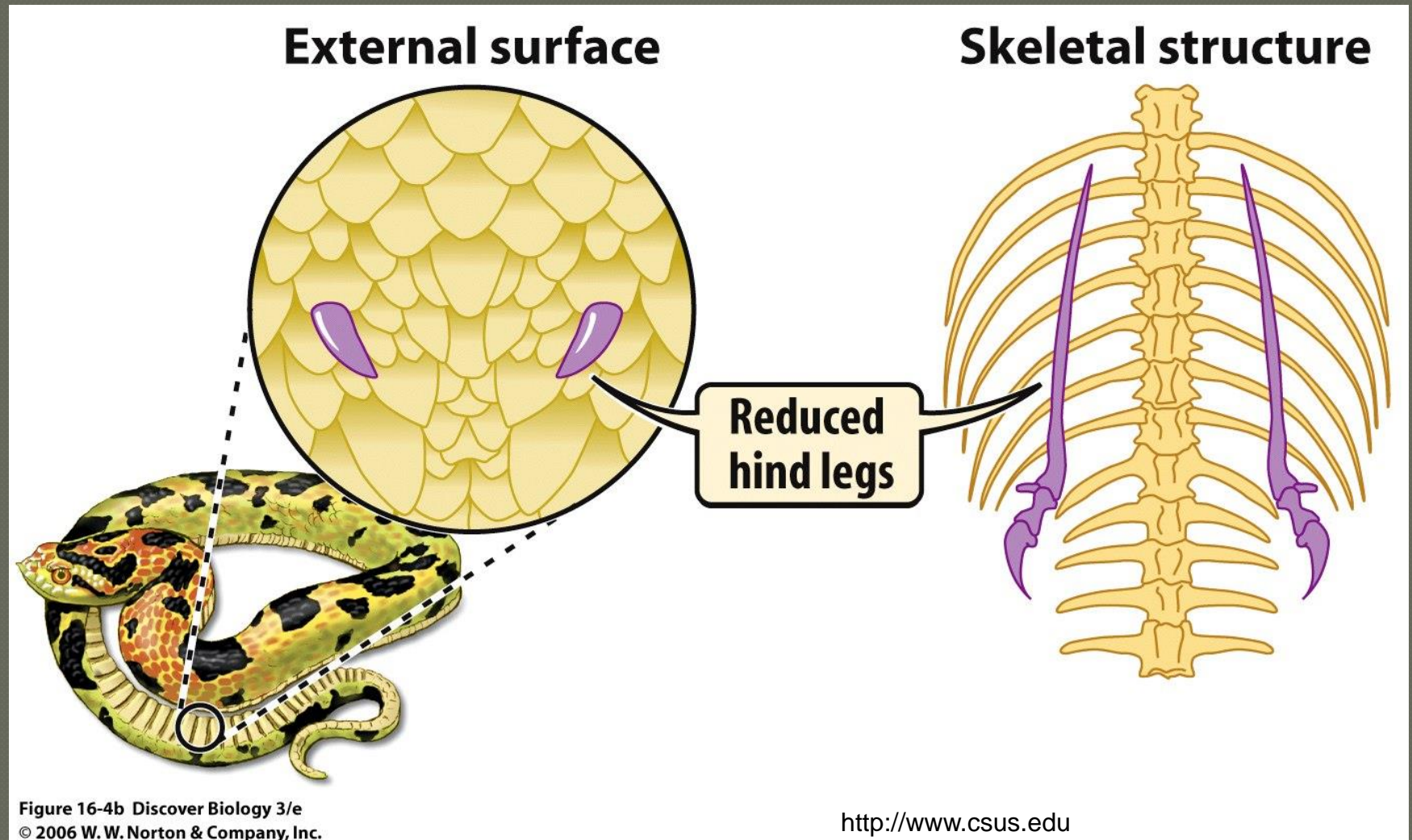
Structures

○ Homologous



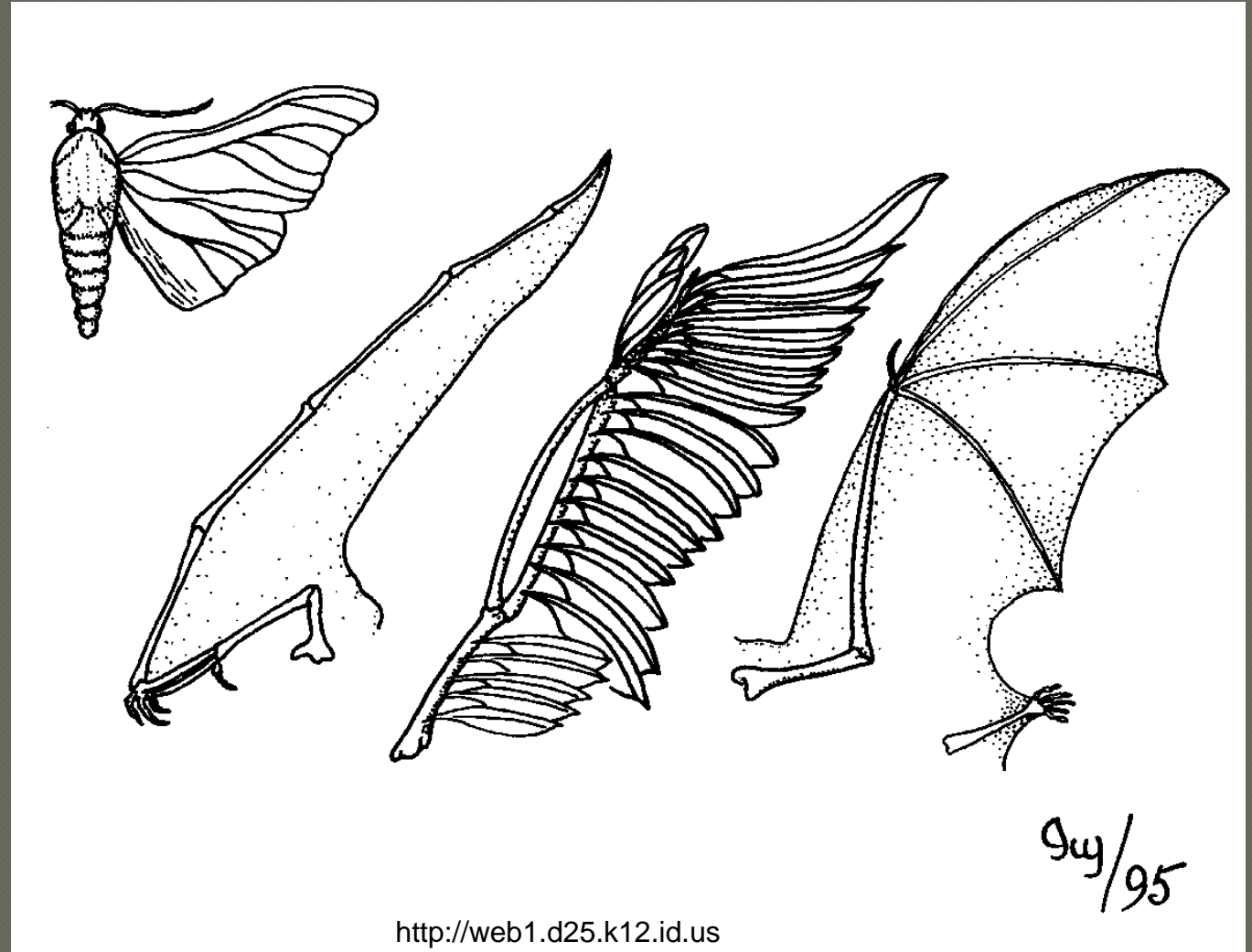
Structures

○ Vestigial



Structures

- Analogous

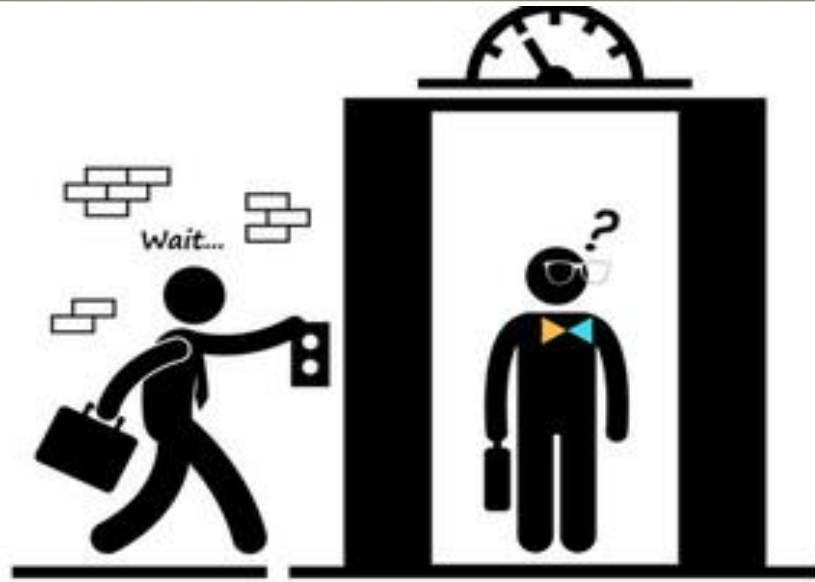


Summary

- Evolution
- Charles Darwin
- Natural Selection
- Species
- Rate of Evolution
- Structures

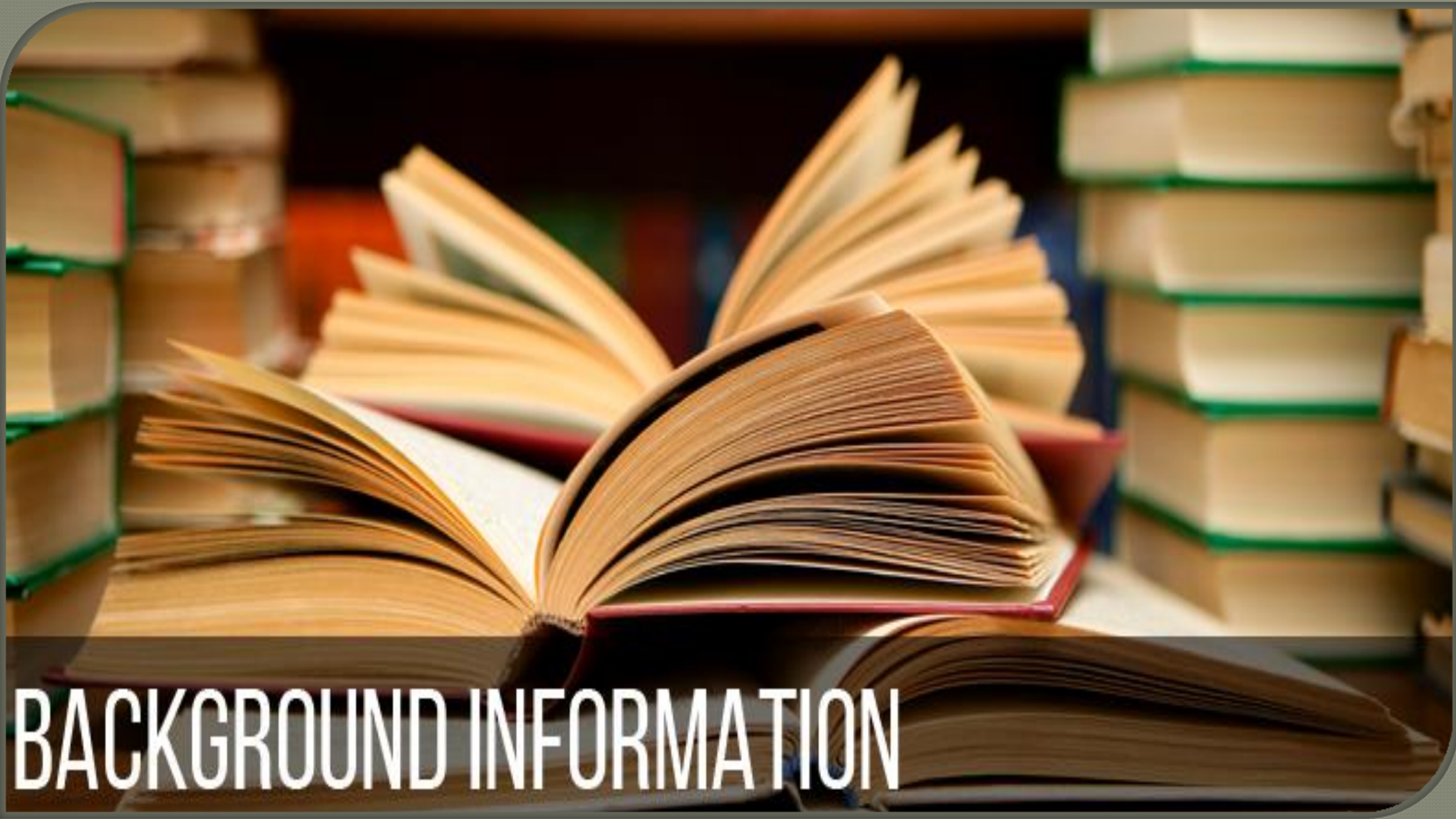


Questions?



Elevator Pitch





BACKGROUND INFORMATION



Materials/Methods



CONCLUSIONS

A :

B :

C :



Font



Serif

vs

Sans-serif



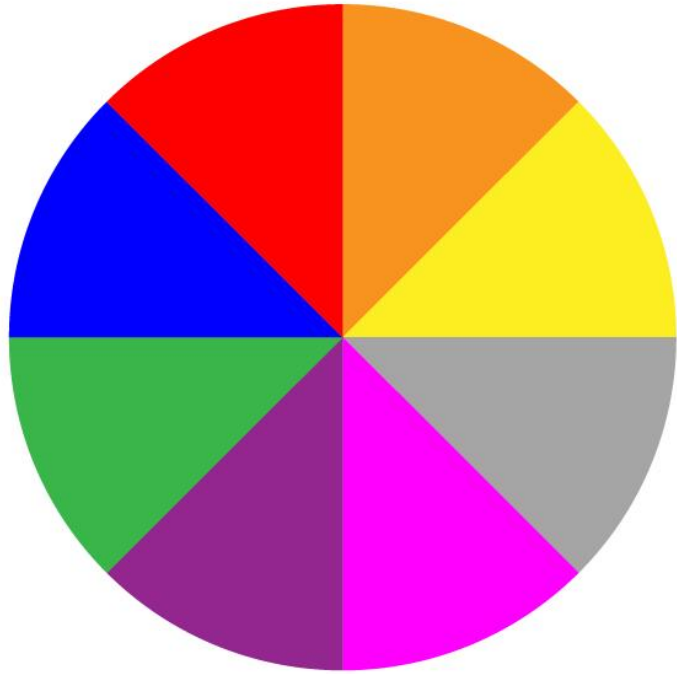
BACKGROUND COLORS

BLACK	RED	WHITE	GOLD	ROYAL
NAVY	SILVER	GRAY	TEAL	PURPLE
ORANGE	OLIVE	FORREST	YELLOW	BURGUNDY
BROWN	COYOTE	KHAKI	LIME GREEN	SOFT PINK

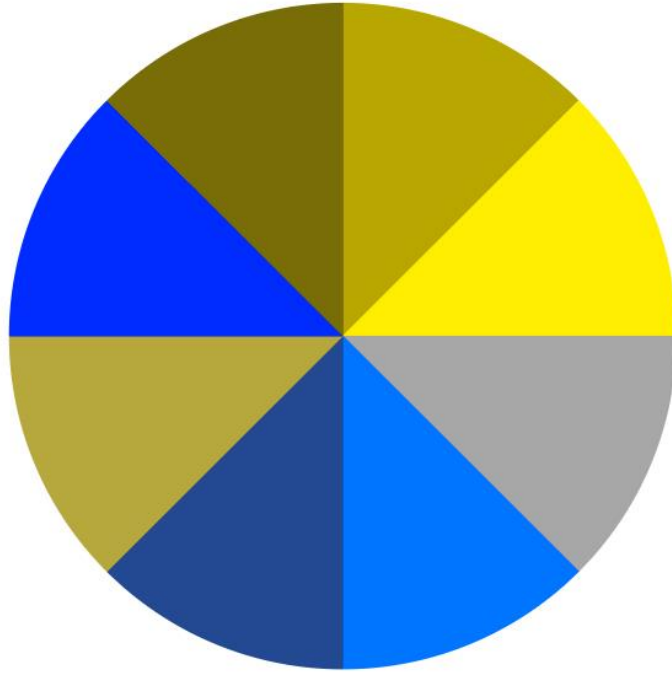
BORDER AND TEXT COLORS

BLACK	RED	WHITE	GOLD	ROYAL
NAVY	SILVER	GRAY	TEAL	PURPLE
ORANGE	OLIVE	FORREST	YELLOW	BURGUNDY
BROWN	COYOTE	KHAKI	LIME GREEN	SOFT PINK
CAROLINA	COPPER	HOT PINK	AQUA	LILY PAD

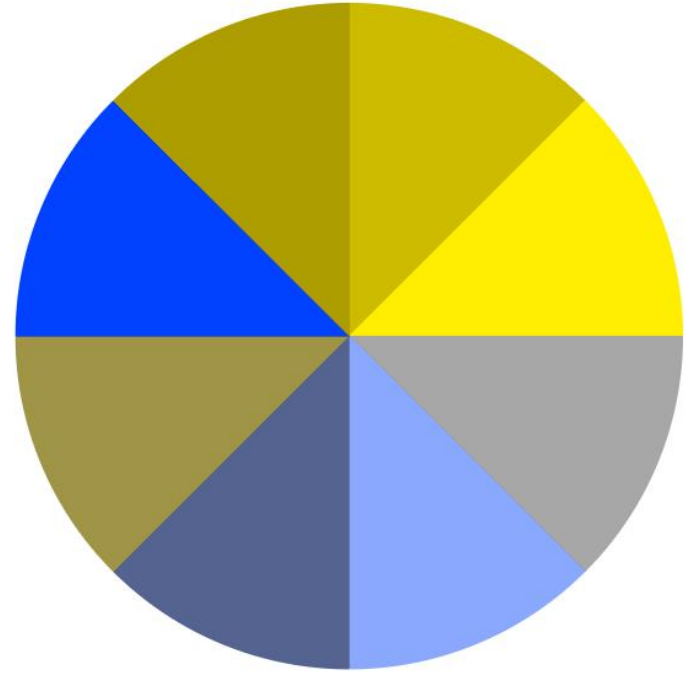
Unaffected Color Vision



Protanopia Type



Deuteranopia Type



too large

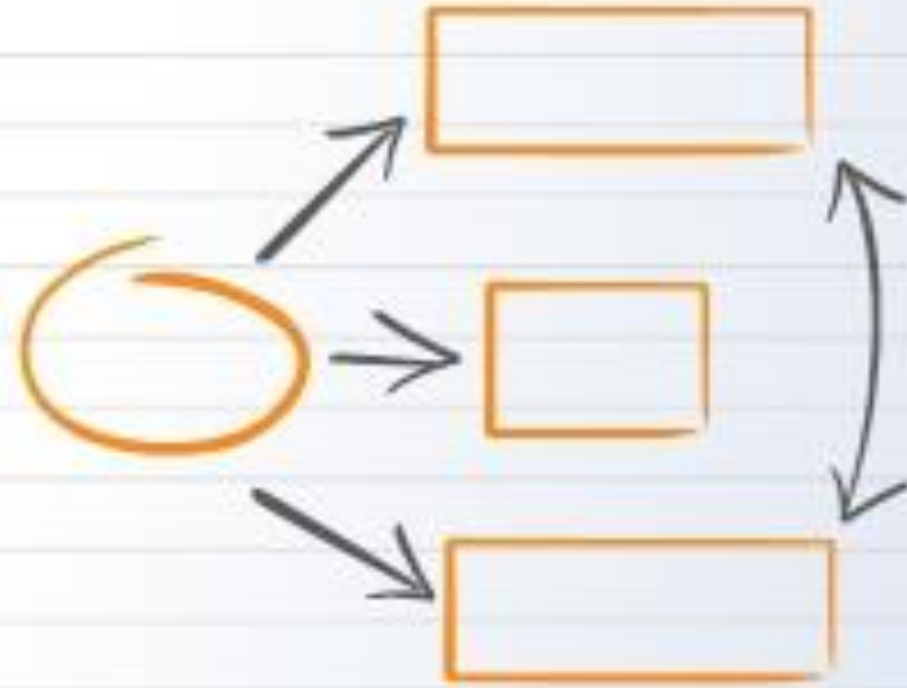
just right-ish

Too small



Alba ^{SAIL} bellbottom VIDEO-EZY Bleeding
Brush BUBBLEGUM BURNT cartoon ^{TRIBAL} Today
CheapFire Cigarstore Cracked DARKCRYSTAL
DESDEMONA EVANESCENCE Fashion Victim Frail&Sedazzled
French Script ^{curly} Ginger HappyHell HarryPotter Lover
HERCULES ^{Bugslife} JAZZLET Jellyka Castles Queen MonaLisa
Holiday Home ^{YellowSubmarine} MONSTERS INC Lollipop ^{WHOA!} MULAN ¹⁹⁹⁴ ^{Elvis}
Blackletter Papyrus PartyTime Petal font ^{Wanted} PlayBill
NARNIA PRINCETOWN SMALLVILLE SantaClaus
SNICKERS StoryBook ^{Porcupine} ^{Fancy Pens} WALT DISNEY
^{WILLY WONKA}

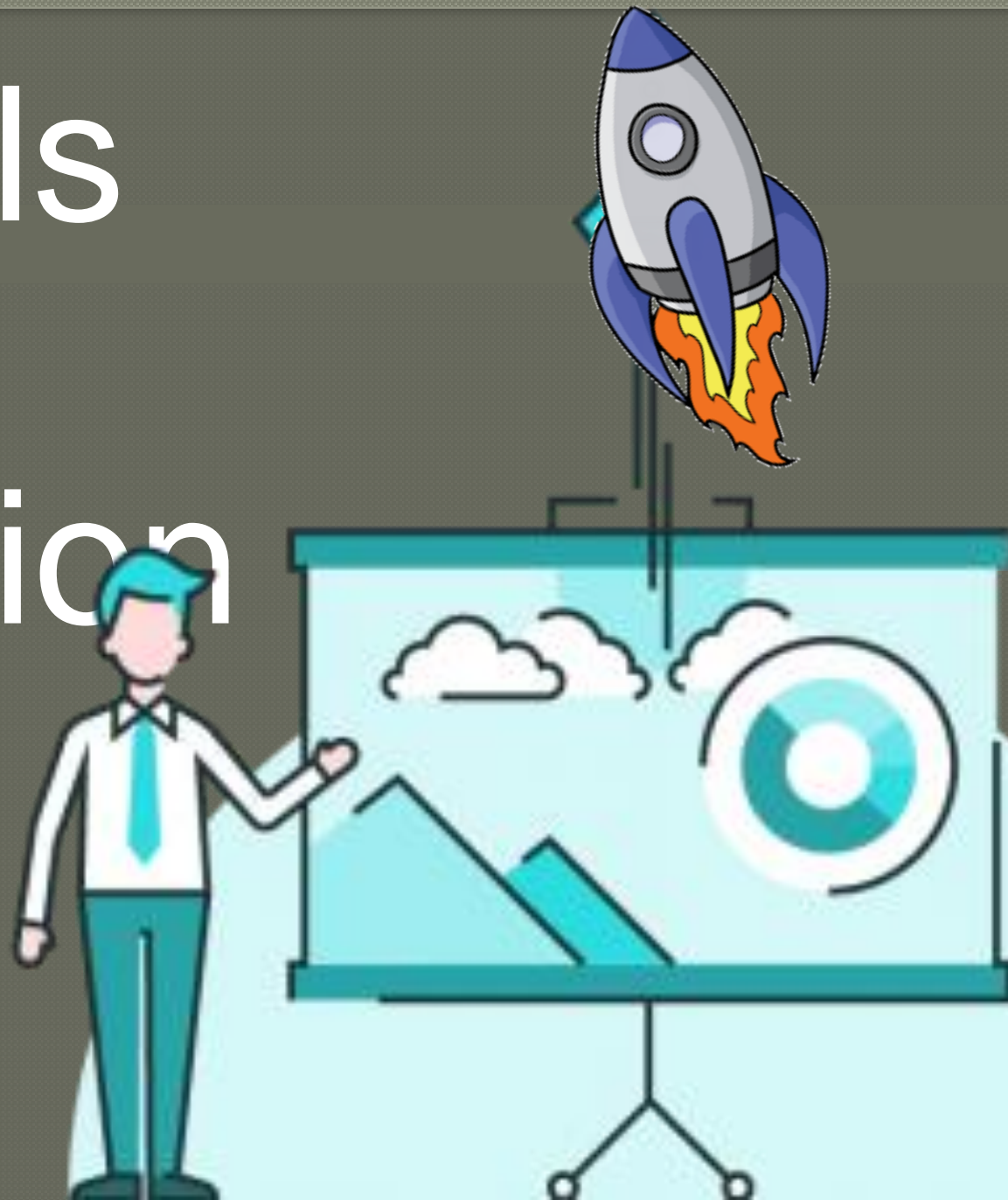
structure of this complex process consist of three main parts and each one has 4 subparts All are interconnected by network of channels which creates star-like distribution allowing access to any point from external environment



Info Diagram

Amount of Info

Visuals and Animation



Organization



Presentation Design

Designing effective presentations & posters

General Principles

Design: Slides

Design: Posters

Design: Data

More Information

Workshop Materials

- **Presentation Design Slides**
For more in-depth presentation tips and examples, download the slides from the Library's presentation design workshop
- **Presentation Design Worksheet**
Worksheet designed to help you develop a thoughtful, targeted presentation

Sharing Your Work

If you want your audience and other

General Presentation Principles

The following core principles apply whether you're creating a poster presentation or slides to accompany an oral presentation

- Think and communicate **visually**: Humans remember images and words better than words alone.
- Be **consistent**: Keep your slides or poster design simple and use a consistent style (fonts, colors)
- **Focus**: Keep your audience focused on your most important points

Structure

- Hook and Preview
- Methods, Data and/or Details (Don't dwell overlong here)
- Conclusion and Takeaways

Other Considerations

- Use **stories** to help people remember your points
- Use **metaphorical** thinking to choose impactful and meaningful images
- Avoid "slide-uments" (slides that contain a high level of text detail). To communicate detail, make a **slideshow** as well as a **handout**/document

<https://libguides.unm.edu/presentations>

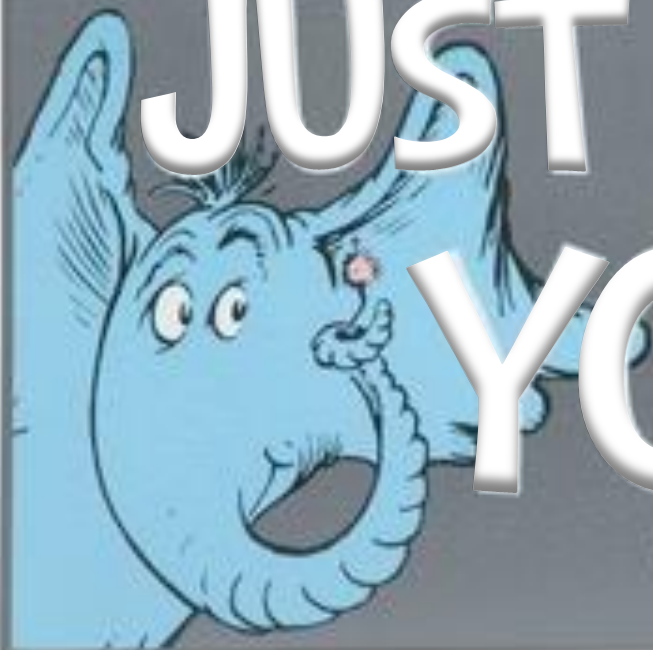
The Real Summary...

BE KIND

BE TRUE

JUST BE

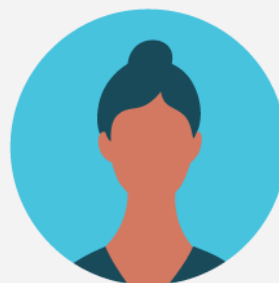
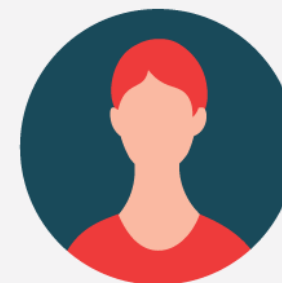
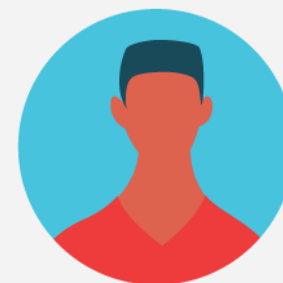
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Dr. Seuss

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BETTER
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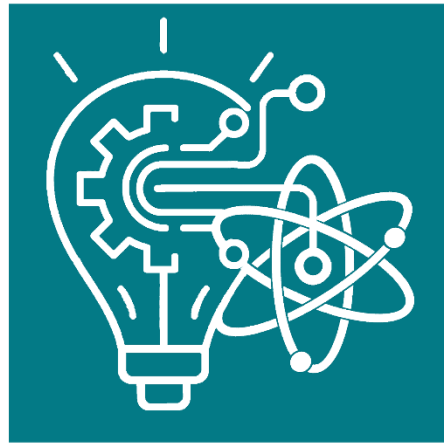
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Data Visualization

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Fundamentals of MATLAB
Critical Thinking & Pop-Science
Basic Excel
STEM/Technical Written Communication
Undergraduate Research Opportunities Conference (UROC)
Impostor Syndrome

Spatial Visualization Series

Two Axis Rotation
Inclined Planes & Curved Surfaces
Reflection Symmetry
Write Rule

Career and Professional Development Events

Resumes and Cover Letters
Interviewing
STEM Mixer & Find Your Pack (joint event)
ACED Presentations
...and industry site visits...

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Hazard Communication & Hazardous Waste Management
Hierarchy of Hazard Control & PPE
Hazard Evaluation & Heuristics

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BUILD your skill set. **ENHANCE** your resume.



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Presentations, oh my!

Free Pizza!

2/22
What is the Conference?



3/1
Delivering Presentations



3/8
Developing Presentations



3/22
Data visualization



Tuesdays
11 AM - 12:30 PM
Centennial Library Den2

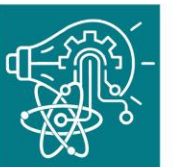
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Take
Away



Image citations

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