

Introduction to Biology. Lecture 2

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Outline

- 1 Questions and answers
 - Comments to introductory test
- 2 Age and time. Basic principles
 - Geological time
 - Some basic principles

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Interesting in being a note taker?

- Disability Services is looking for a note taker in this class. The individual will be paid for taking notes.
- Interested students who will have **consistent attendance** and take complete and legible notes should contact:
- **Melanie Moore**, Student Health and Development Center
Lower level Lura Manor (must enter through South Door
facing University Ave) or call 858-**4233**



Change of section policy

If you have a legitimate reason (see below) it is possible to come for the lab with different section. Please, however, do not forget to inform **both** instructors in advance. Their e-mails:

Ament, Aaron	<code>aaronament@me.com</code>
Ihli, Lori	<code>ihlilori@hotmail.com</code>
Shipunov, Alexey	<code>alexey.shipunov@minotstateu.edu</code>
Super, Heidi	<code>heidi.super@minotstateu.edu</code>

Only these four instructors teach our Intro labs. There is a separate Biol 111 course with different instructor; please do not come to these sections.



Questions and answers

Comments to introductory test

Question 1

1 Why deciduous plants take off their leaves?

- A To prevent freezing
- B To prevent drying**
- C To get rid of poisonous chemicals



Question 2

2 Where does human digestion process start?

- ☒ A **In the mouth**
- ☐ B In the intestines
- ☐ C In the stomach

Amylase and lipase



Question 3

3 Which birds do NOT live in Minot on winter?

- A Crows
- B **Hummingbirds**
- C Sparrows



Question 4

4 Home country of watermelon:

- ☐ A Central America
- ☐ B Canada
- ☒ C **South Africa**



Question 5

5 Why do insectivorous plants eat insects?

- A To obtain the lacking mineral resources**
- B To get an addition to their common “menu”
- C To get rid of herbivores



Question 6

6 Which insects have no queen?

- ☐ A Bumblebees
- ☐ B Ants
- ☒ C **Cockroaches**



Bumblebees

Question 7

7 Oak tree is pollinated by:

- ☒ A Wind
- ☐ B Bees
- ☐ C Flies



Oak flowers

Question 8

8 Spider has:

- A 6 legs
- B 8 legs**
- C 4 legs



Question 9

9 Apple flower has:

- ☒ A **5 petals**
- ☐ B 4 petals
- ☐ C 3 petals



Question 10

10 Frightened man has:

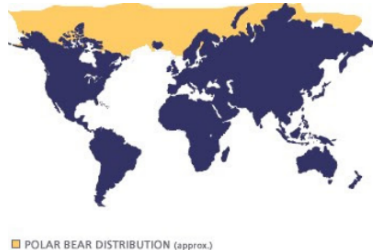
- ☒ A **Bigger pupils**
- ☐ B Smaller pupils
- ☐ C Normal pupils



Question 11

11 Polar bears are not eating penguins because:

- ☐ A Penguins run very fast
- ☒ B **They cannot meet**
- ☐ C Penguins are poisonous for bears



Question 12

12 How many toes are on each of cat's hind legs?

- ☐ A 5
- ☐ B 4
- ☐ C 3



Question 13

13 Pineapple is a:

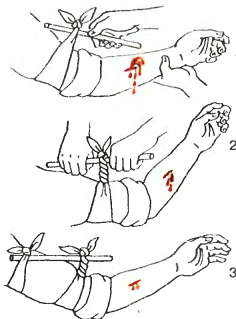
- ☐ A Tree
- ☐ B Shrub
- ☒ C **Herb**



Question 14

14 If somebody has an artery cut on the arm or leg, it is recommended:

- A Put a tight bandage below the cut
- B Put a tight bandage above the cut**
- C Do nothing



Question 15

15 Which of the following is the most precise statement?

- A We are breathing to support our life
- B **We are breathing to obtain the energy from food**
- C We are breathing to have enough strength for food consuming



Question 16

16 Which tree is better to plant in Minot house backyard:

- ☐ A Sycamore
- ☒ B **Ash**
- ☐ C Yew



Question 17

17 Moles eat:

- ☒ A **Worms**
- ☐ B Roots
- ☐ C Frogs



Question 18

18 Which fish gives birth to the fully developed offspring?

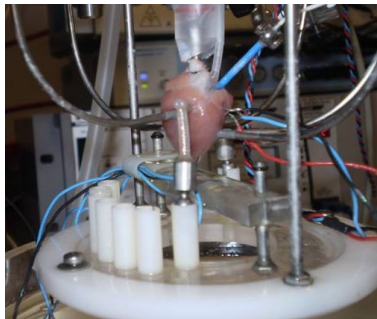
- ☐ A Sturgeon
- ☒ B **Shark**
- ☐ C Flounder



Question 19

19 Which human organ lives longer?

- ☒ A **Heart**
- ☐ B Lungs
- ☐ C Brains



Question 20

20 Which plant normally has a longer root?

- ☐ A Spruce
- ☒ B **Chokecherry**
- ☐ C Blueberry



Fallen spruce tree

Age and time. Basic principles

Geological time



First attempts to calculate age of Earth

- Helmholtz (1853) calculated that if Sun is shrinking to obtain the energy, then the age of Earth should not exceed 18 My (millions of years, 18,000,000 years)
- Lyell (1830) calculated that if the speed of sedimentation was the same in the past, then age of Earth should be approximately 200 My



Use of radioactivity

- In 1896, Becquerel discovered radioactivity. It was found that some atoms are constantly breaking into smaller ones, sometimes with very slow speed
- Consequently, it is possible can calculate the age of mineral from the concentration of radioactive elements

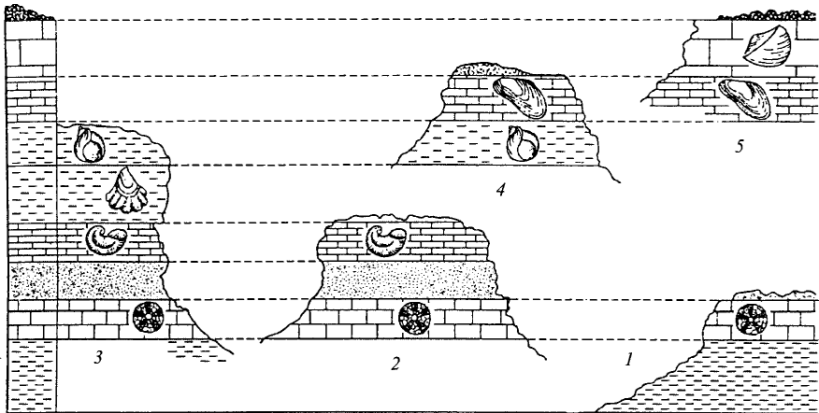


Stratigraphy

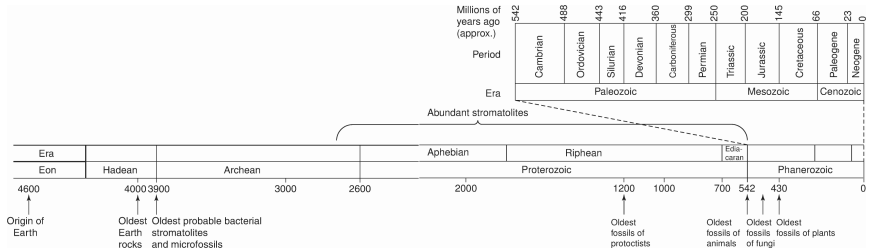
- Upper layers are younger than lower
- Two layers contained similar species of fossils have the same time of origin



How stratigraphy works



Geological scale



Age and time. Basic principles

Some basic principles



Principle of actuality

- Charles Lyell (1830)
- “The present is the key to the past”



Occam's razor

- Father William of Ockham (ca. 1300)
- “Plurality must never be posited without necessity”



Science as falsification

- Karl Popper (1963)
- “If something cannot be proved wrong, then it is meaningless”



Null and alternative hypotheses

- Ronald Fisher (1935)
- Null: nothing happened; alternative: something happened
- Normally, we are able only to reject one of them and **fail-to-reject** the other



Summary

- Geological time is calculated on the basis of both relative (stratigraphy) and absolute (radioactivity) methods
- Science is based on the principles of actuality, falsification, Occam's razor, and hypothesis testing

For Further Reading



Biology. Wikipedia.

`http://en.wikipedia.org/wiki/Biology`



History of Life. Wikipedia.

`http://en.wikipedia.org/wiki/History_of_life`

