• Small intestine

The implications of body sixe on metabolism

- How can you measure metabolism
- You could measure oxygen consumption, calorie output, power
- Bigger animals need more food
- Pound per pound, bigger animals actually eat less food than smaller animals

Preview from Notesale.co.uk Page 5 of 52 second photo system 2 is first, phorosyntheses 1 comes later.

### PS 2

- Photons excite molecules in reaction center, releasing it
- Excited e move down ETC in thylakoid membrane drawing, H+ into thylakoid space.
- Water is spilt into H+
- H+ accumulates in Thylakoid space, creating diffusion gradient ٠
- H+ gradient used to drive ATP production in ATP Synthase.
- Photons excite molecules in "reaction center," releasing e-•
- e- and H+ bind with NADP+ to NADPH
- electrons of water replace lost electrons in the reaction center
- Hydrogen piles up in the extra space
- Oxygen diffuses into the cell
- Electron transport enables the creation of a hydrogen gradient lotesale.co.uk between the thylakoid space and the stoma.

Fermentation

- There is no oxygen present
- No citric acid cycle
- either to lac Pyruvic Acid is tonve or ethanol
- Calvin Cycle
  - Occurs in stom
  - Input: ATP, NADPH (from light reaction) and CO2
  - Output: G3P (sugar), ADP, NADP+
  - A cycle whereby a 5-C sugar (RuBP) binds with carbon dioxide
  - This ^-C molecule splits into two #-C molecules
  - ATP and NADPH used to make G3P, which is building block of glucose

# Chapter 13, Lecture 12

Evolution

- What is evolution
- Theory of Evolution
  - Focusing on the fundamentals
- Science and non-science

Evolution: the genetic change in a population or species over generations Darwin's theory of Evolution

- First person who brought evolution to the scientific community
- Five components
  - The mechanism is natural selection
  - Common descent
  - Gradual change
  - Periodic change
  - Speciation
    - Evolution of new species

Theory of Evolution

- Reproductive Success
- otesale.co.uk Tendency for geometric increase
  - + environmental Rest
- age for Existence
- Competition
  - + heritable variations
- Natural Selection
  - Persistence of adaptive traits
  - +Environmental changes
- Evolution
  - Change in a trait

Modern Synthesis (1900's)

- Several mechanisms of evolution in addition to natural selection
- Characteristics are inherited as discrete entities called genes
  - Mendel
- Variation within a population is due to the presence of multiple alleles of a gene
- Speciation is (usually) due to the gradual accumulation of small genetic change

**Mechanisms** 

## Lecture 15, Chapter 14

What to know

- The history of life
  - Know the Eras
  - The timelines
  - And the major events associated with these times
- What is a species
  - Biological species concept
- How do new species evolve
  - Geographic speciation
  - Sympatric speciation
- How are species classified
  - Taxonomy vs. systematics
  - Phylogenetic systematics
- How do we know these things?

The Cambrian explosion

- After 15 million years all animals appear in fest fecord
  Increase in diversity
- (Conciliantilies) Increase in diversity (number of of 52

Mass extinctions

- Permian extinct
- nave been
- half of the families of parine animals died
- **Dinosaurs** extinction
  - Cretaceous extinction

Precambrian Era

- Prokaryotes
  - Gave rise to eukaryotes
- Eukaryotes
- 4600-500 mya

Paleozoic Era

- 500-250 mya
- Most animals appear
- Plants
- Vertebrates: fish, reptiles, amphibians
- Beginning of Cambrian explosion
- Most animals appear on earth
- Plants exist

- Phylogeny is analogous to genealogy
- All organisms that are alive today have a common history

Tree

- Cladogram
  - Built using traits that enable you to move from most inclusive to least inclusive groups

oup

• Sister groups are close relatives within the tree.

### Bacterial Phyla

- 1. Systematics
- 2. Bacteria
  - o diversity
  - $\circ$  role in biology of humans
  - $\circ$  compare to viruses
  - o metabolism and reproduction
- 2. Protista

The rates of decay that can be measured today are lesame as the rates many years ago/

Derived traits vertebra is associated

Domain Archea

Live in the most extreme hashest environments in the world

Viruses

All parasites

- Tips of roots and shoots
- New growth

**Organs Definition** 

- Systems of tissue that work together to preform a function
- Organs must have more than one tissue type associated with them
  - Reproduction
  - o Immunity
  - Circulation
  - Respiration
  - Feeding and Digestion
  - Water and salt Regulation
  - Communication
  - Movement
  - Support

Plant Organs

- Leaf
- Flower
- Stem •
- Rootstems

Human Organ System

- N from Notesale.co.uk enpage 43 of 52 tem Gkeletal system
- Muscular system
- Digestive system
- Respiratory system
- Nervous system
- Circulatory system
- Endocrine system
- Reproductive system
- Lymphatic system
- Integumentary system
- Immune system
- Urinary system

Architecture of organisms and body sixe

- Flat body: Increase surface area
- Internal skeleton: Increases support of body
- Aquatic: buoyancy of water reduces costs

- Circulatory system: transport of materials
- Predators: big enough to catch prey
- Endothermic: a SA/V thing

### SA/V

- Exoskeleton grows in proportion to the square of length
- Volume grows in proportion to the square of length
- Volume grows in proportion to the cube of length
- Mass grows faster than ht skeleton to support it
- Tubes deliver air to body tissues
- Ability to deliver air to tissues via trachea decreases with body size
- Smaller the dimater and the longer the tube become and the you increase the finction and it becomes harder to breath.

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