

# BIOLOGY FLIPCARDS™

CONCEPTS ON-THE-GO



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# BIOLOGY FLIPCARDS



*Biology FlipCards* organizes a vast amount of information for the serious science competitor and presents key elements of science in a concise and compact format. *Biology FlipCards* are not a replacement for an in-depth study of biology, but rather a method of reinforcing basic biology concepts that appear on many state and national tests. We believe you will find *Biology FlipCards* to be a handy reference guide and an integral part of contest preparation in the field of science. This product is also ideal for high school study and for college biology intro courses. This product is single-hole punched for those who wish to insert the flip cards into a binder.

Good luck in your science endeavors!

## TABLE OF CONTENTS

<b>Topic</b>	<b>Pages</b>
Biology Basics/Chemistry .....	5-17
Cells .....	18-23
Metabolism .....	24-35
Genetics .....	36-48
DNA .....	49-55
Evolution .....	56-62
Organizing Living Things.....	63-66
Viruses/Prions .....	67-69
Bacteria .....	70-72
Protists .....	73-79

## TABLE OF CONTENTS - continued

<b>Topic</b>	<b>Pages</b>
Plants.....	80-95
Fungi.....	96-97
Animals.....	98-112
Human Physiology.....	113-143
Ecology .....	144-150

# **Biology Basics**

Pages 5-17

## Metric Measure

- Base 10 system; change prefix to change quantity
- Base units
  - Temperature: degrees Celsius
  - Length: meter
  - Mass: gram
  - Volume: liter
  - Time: second
- Kilo, hecto, deka, base, deci, centi, milli
- 1000, 100, 10, base, 0.1, 0.01, 0.001

## Chemistry of Life

- Four elements make up 97% of all living matter
  - Carbon, oxygen, hydrogen, nitrogen
- Sulfur, phosphorus, potassium, calcium make up remainder
- Hierarchy of life organization
  - Atom-molecule/compound-organelle-cell-tissue-organ-system-organism
- **Atom:** smallest particle of element that still has characteristics of element
  - Protons ( $p^+$ ), positive charge, in nucleus
  - Neutrons ( $n^0$ ), neutral charge, in nucleus
  - Electrons ( $e^-$ ), negative charge, in electron cloud



# Metabolism

Pages 24-35

## Metabolism

- Sum of all chemical reactions of building and breaking down
- Anabolism: building up of molecules
- Catabolism: breaking down molecules
- The two above are linked by ATP (adenosine triphosphate)
- **ATP**: adenosine triphosphate consists of nitrogen base adenine, ribose sugar and three phosphates
- Breaking of phosphate bonds releases energy; building of bonds stores chemical energy
- ATP is the universal energy molecule used by all living organisms

## Prions: The Nonliving, Infectious Proteins

- Discovered by *Stanley Prusiner*
- Molecule that spreads infectious disease, not living
- Diseases Caused by Prions:
  - *Creutzfeldt-Jakob Disease*
  - *Wasting Disease*
  - *Bovine Spongiform Encephalitis*
  - *Kuru*
- All are degenerative nerve diseases

## Gymnosperms

- Word means “*naked seed plant*”
- Main divisions: conifers, ginkos, cycads
- **Ginkos:** maidenhair tree only surviving species
- **Cycads:** look like palms, cone in center of plant
- **Conifers:** cone-bearing plants; pines, spruce, fir, larch, juniper, cedar, cypress, redwood; most evergreen
  - Conifers have both male and female cones: male cones smaller and produce pollen; female cones larger and are where seeds develop.

## Subphylum *Vertebrata*

- **Agnathans:** jawless, lamprey, hagfish
- **Chondrichthians:** cartilage, jawed fish, sharks, skates, rays
- **Osteichthians:** bony, ray-finned fish, bass, perch, tuna
- **Amphibians:** Two lives, 1<sup>st</sup> true tetrapods, tied to water
- **Reptiles:** 1<sup>st</sup> amniotic egg, most are cold blooded
- **Aves:** birds, definite tie to reptile lineage
- **Mammals**
  - *Monotremes:* egg laying mammals: platypus
  - *Placentals:* placenta feeds fetus; humans
  - *Marsupials:* pouched, fetus develops outside of body

## **KENNETH DAVIS**

The author, Kenneth Davis, earned his B.S. from Texas A&M University and a M.S. in microbiology from The University of Texas Health Science Center. He has taught science for 25 years, in the areas of elementary enrichment, middle school, high school, Advanced Placement, dual credit, and at the college level.

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