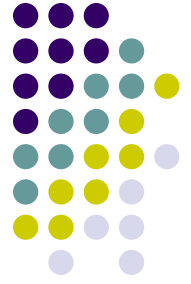
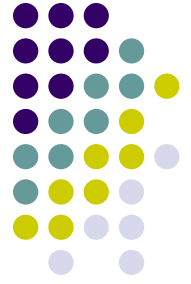


# Vitamins

- Definition
- Function
- Variance from macronutrients
- Forms of vitamins in food
- Adequacy





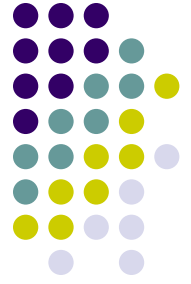
# Bioavailability of Vitamins

- Digestive efficiency and transit time
- Nutritional Status
- Consumption of additional foods at the same time
- Method of food preparation
- Source of the nutrient

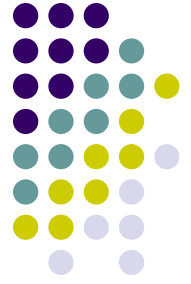
# Vitamins

**Water-Soluble Vitamins**

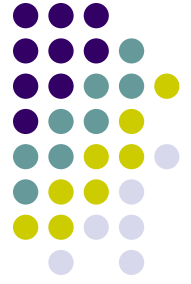
**Fat-Soluble Vitamins**



# Water-Soluble Vitamins

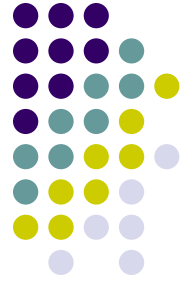


- Source
- Absorption
- Amount Required
- Storage



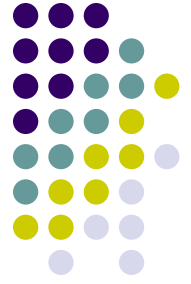
# B Vitamins

- Functions
- Absorption
- Food Sources
- Requirements
- Factors affecting individual requirements



# Vitamin C

- Functions
- Absorption
- Food Sources
- Requirements
- Factors affecting individual requirements
- Additional uses
- Ongoing Scientific Investigations
- Myths



# Fat-Soluble Vitamins

- Functions
- Food Sources
- Absorption
- Requirements
- Factors Affecting Individual Requirements
- Ongoing Scientific Investigations

# Vitamin A and Beta Carotene



- Group of compounds consisting of retinoids and carotenoids
- Roles:
- Deficiencies
- Toxicities



# Vitamin D

- Functions
- Sources
  - Food
  - Sunlight
- Requirements
  - Deficiency Symptoms
  - Toxicity Symptoms
- Factors Affecting Individual Requirements
- Ongoing Scientific Research

# Minerals

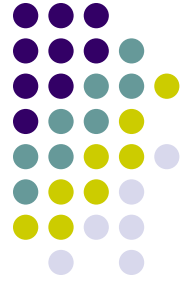
- Definition
- Functions
- Utilization in the body

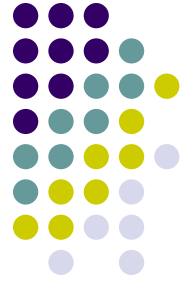


# Essential Minerals (15)

- Major Minerals

- Trace Minerals

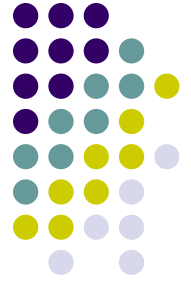




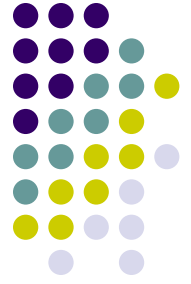
# Functions

- Maintain fluid balance
- Regulate nerve impulses and muscle contraction
- Regulate blood pressure
- Form and maintain structure of bones/teeth
- Antioxidant
- Important in growth and development
- Support immune system

# Calcium



- Functions
- Sources
- Requirements
- Factors Affecting Individual Requirements
- Ongoing Scientific Investigations



# Calcium Balance

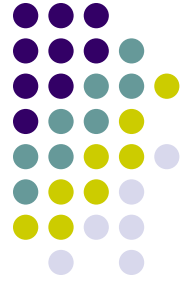
- Regulated by vitamin D and hormones
- Maintenance of blood calcium
- Bone is constantly remodeled
- Peak bone mass
- Requirements
- Factors Affecting Individual Requirements

# Osteoporosis

- Development
- Bone compartments



# Risk Factors for Osteoporosis



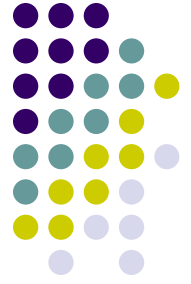
- Gender
- Age
- Genetics
- Physical Activity
- Body Weight
- Smoking
- Alcohol
- Dietary Calcium



# Prevention of Osteoporosis

- Maximize bone mass
- Minimize bone loss
- Maintain calcium and vitamin D intake throughout life
- Weight Bearing Exercise
- Consider supplements if diet is inadequate
  - Amount
  - Absorption factor

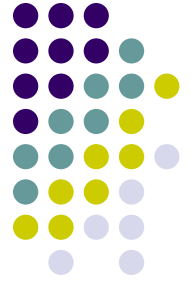
# Antioxidants



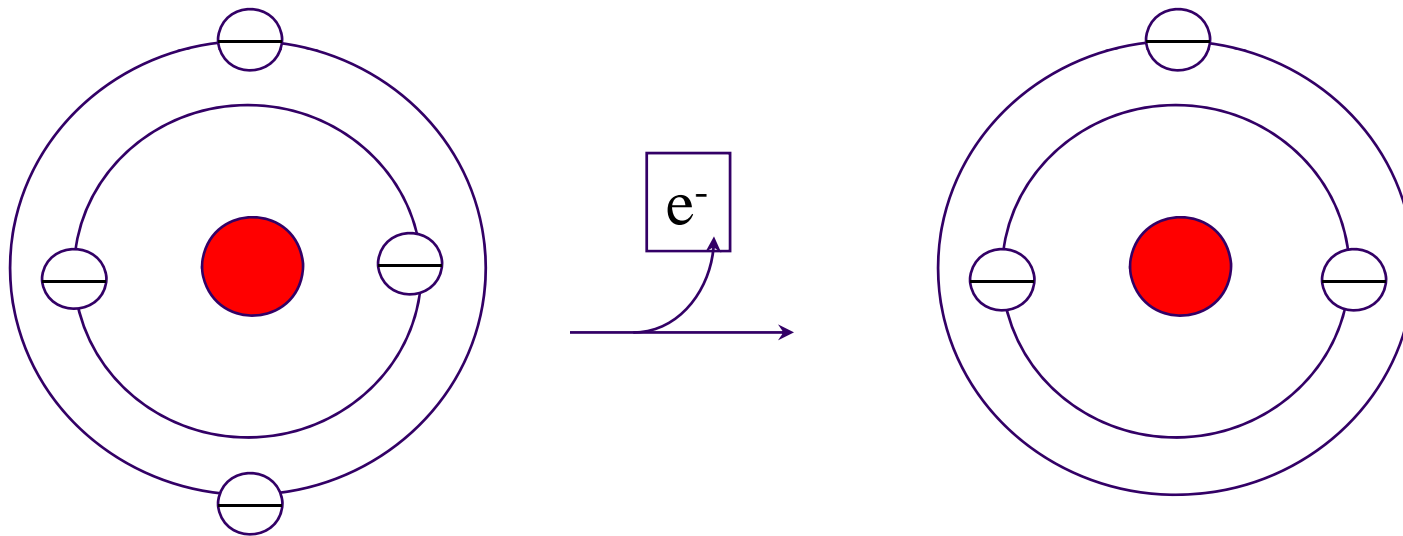
- Definition
- Function
- Sources
- Requirements
- Ongoing Scientific Investigations



# Free Radical



- Atom that has lost an electron



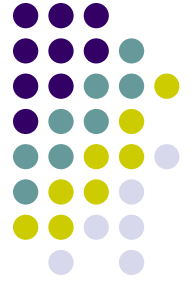


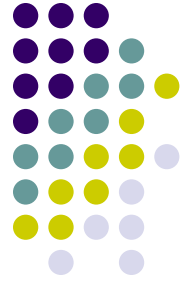
# How Antioxidants Work

- Block oxidative reactions by neutralizing free radicals
- Process
- Requirements
- Deficiencies and Toxicities

# Free Radicals Play a Role In

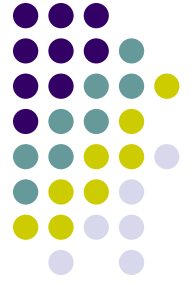
- Heart Disease
- Cancer
- Emphysema
- Bronchitis
- Premature aging





# Phytochemicals

- Definition
- Non-essential nutrient
- Functions:
  - Antioxidant
  - Hormonal Action
  - Stimulate Enzymes
  - Interfere with DNA replication
  - Antibacterial
  - Physical Action
- Food Sources



# Red

- Lycopene, Anthocyanins
- Functions
- Food Sources





## Yellow/Orange

- Vitamin C, Carotenoids, Bioflavonoids
- Functions
- Food Sources





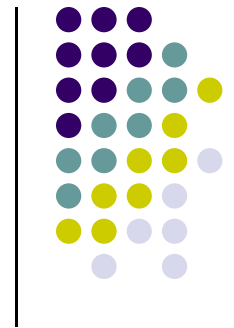
# White

- Allyl Sulfides
- Functions
- Food Sources



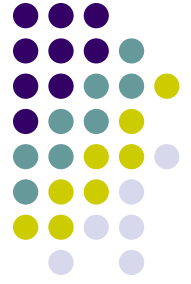
# Green

- Lutein, Indoles
- Functions
- Food Sources



# Blue-Purple

- Anthocyanins, Phenolics
- Functions
- Food Sources



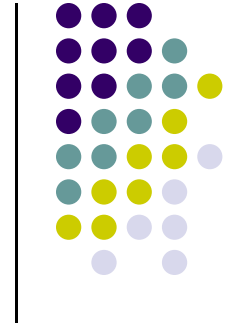
## Others

- Isoflavones, Saponins
- Functions
- Food Sources

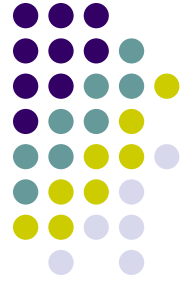


# Other

- Flavonoids
- Functions
- Food Sources



# Incorporating Antioxidants and Phytochemicals Into the Diet



- Keep fruits and vegetables on hand
- Use fresh/canned fruit as toppings
- Drink 100% juice instead of soda
- Add fruit/vegetables to salads, casseroles



# Who May Need Vitamin/Mineral Supplements

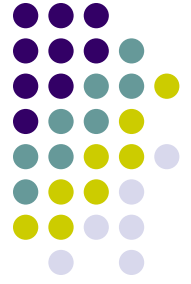
- Individuals with poor eating habits
- Vegetarians
- People who consume less than 1200 calories per day
- Medical problem that affects nutrient digestion or absorption
- Women who have heavy menstrual periods
- Postmenopausal women
- Pregnancy
- Smokers
- Excessive consumption of alcohol



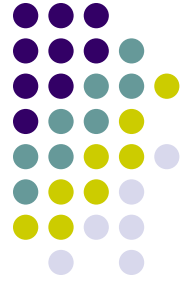
# Evaluating Dietary Supplements

- Read label carefully
- Avoid megadoses
- Look for USP on the label
- Natural or Synthetic
- Check expiration dates
- Not a substitute for a healthy diet

# Water



- Functions
  - Temperature regulation
  - Remove waste products
  - Lubricant and shock absorber
  - Transport nutrients
  - Essential for digestion, absorption and excretion of waste products

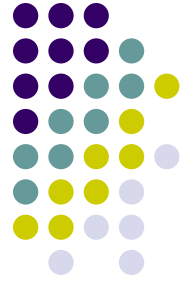


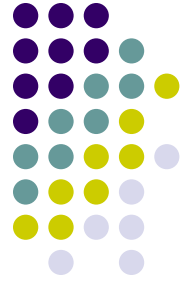
# Water Balance

- Controlled by thirst
- Without water
  - Hypothalamus signals brain to drink
  - Fluid conservation continues
  - Pituitary gland secretes ADH (kidneys conserve water)
  - Fluid volume drops, blood pressure falls
  - Cascading of hormones from the kidney to conserve water

# Dehydration

- 2%
- 4%
- 10-12%
- 20%

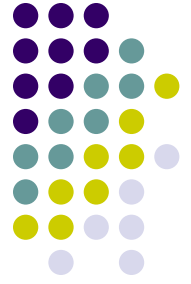




# Individuals Susceptible to Dehydration

- Elderly
- Athletes
- Illnesses with fever, vomiting, diarrhea
- Airplane travel
- Young children and infants

# Water Intoxication



- Excessive intake can exceed kidneys capacity to excrete it
- Symptoms:

# Fluid Requirements

- 1 ml/kcal consumed
- Average 64 oz/day
- Water Balance
  - Water Sources
  - Water Losses

