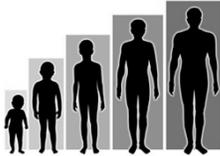


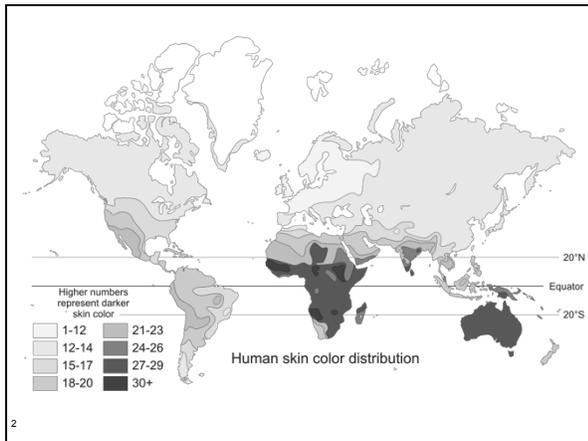
Growth & Development

Objectives

- Understand the relationship between skin color and solar radiation
- Understand the implications of lactose intolerance
- Understand how the nervous and hormonal systems regulate growth
- Understand the stages of human growth
- Understand how growth studies are conducted
- Understand proportional growth and aging



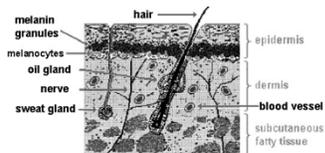
1



2

Skin Color

- melanin: pheomelanin/ eumelanin**
- melanocytes**
- ultraviolet radiation**
- skin cancer (melanoma)**
- tanning**
- vitamin D₃ - calcium absorption**
- Gloger's Rule**



3

Lactose Intolerance

- lactose: milk sugar
- lactase: enzyme
- lactase deficiency



4

Human Growth

Growth (quantitative) cellular growth

- hyperplasia - increase in cell number
- hypertrophy- increase in cell size

Development (qualitative) cellular differentiation

- positive growth
- involution or aging



5

Famous Quotes

"Growth is the study of life from the womb to the tomb"

"Growth is the study from sperm to worm"



6

Reasons to Study Growth

- To understand variation
- Interaction of genes and environment
- Biology & culture
- Adaptation at all stages in growth
- Twin studies- growth
- Growth processes very susceptible to stress

7

Stages of Growth

Prenatal

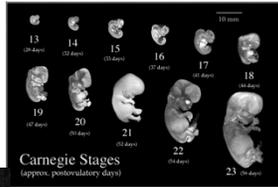
Ovum: 0-14 days

Embryo: 14 days

- 8 wks.

Fetus: 8 wks. -

birth



8

Postnatal

Neonatal: 0-4 wks.

Infancy: 1st year

Childhood

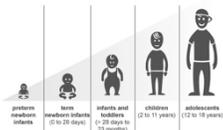
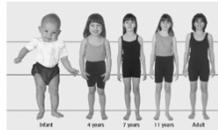
early (1-6 yrs)

late (7-12)

Adolescence:

♀ 10.5 - 13 yrs.

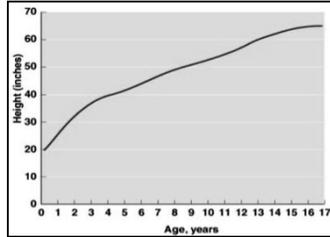
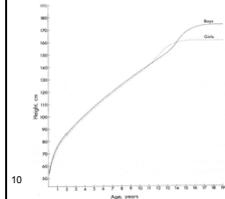
♂ 12.5 - 15.5 yrs.



9

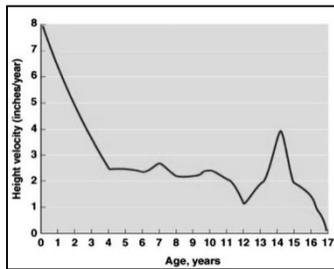
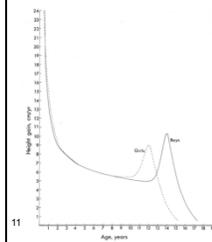
Methods of Studying Growth

Distance or cumulative curve



Velocity of Growth

Incremental curve



Growth Studies

1. **Longitudinal:** Measures sample of like-aged individuals over many years.
2. **Cross-sectional:** A large group of children representing all ages that are measured at once.
3. **Mixed studies:** Follow groups of children aged 6, 9, 12 and 15 years old for three years.

12

Adolescence

The transition from childhood to adulthood

Most humans and primates experience a growth spurt.

Marked changes in behavior, physical and sexual development occur during puberty.

There is an increase in stature, weight gain, and the appearance of secondary sexual characteristics.

Females experience their first menarche.



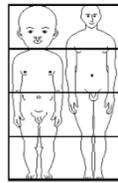
13

Relative or Proportional Growth

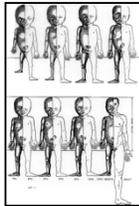
From newborn to adulthood:

1. Head doubles (2X)
2. Trunk region increases 3X
3. Upper limb 4X
4. Lower limb 5X

At birth, average weight: 7.5 lbs.; length: 20 inches. At one year of age, body weight: 20 lbs., length: 30 inches.



BIRTH 20 yrs



14

Changing Proportions

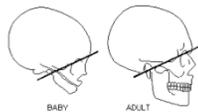
Newborn Face: Vault

1:8

Adult 1:2

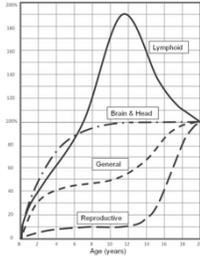
Birth height x 3.5 =
adult height

Birth weight x 20 =
adult weight



15

Morphological (Scammon's) Curve



1. General
2. Reproductive
3. Brain & Head
4. Lymphoid

16

Aging



Programmed stage?

Life expectancy

Life span



17

Study Guide –Exam I

- When: October 2 at 9 AM (arrive before 9 AM for early start)
- What: ~75 multiple choice questions
- Bonus question (5 pts.)
- Covers: Chapter 1-4 & 14-16 and PPT lecture material
- Bring hand calculator
- Study sessions

18
