

Board –CBSE

Class –8th

Topic – Reaching the Age of Adolescence

Adolescence:

The period of life, when the body undergoes changes, leading to reproductive maturity is known as adolescence. Generally, adolescence begins at the age of 11 and lasts up to 18 or 19 years of age. Adolescents are also called teenagers because the number of years during adolescence span is counted as 'teen', e.g. thirteen, fourteen, and fifteen.



Puberty:

The process of transformations taking place during the adolescence period is known as puberty. The onset of puberty points out the starting of adolescence. And the end of adolescence or puberty informs about the completion of reproductive maturity.

Changes taking place during puberty

1. Increase in Height:

During puberty sudden increase in height takes place. This happens due to the elongation of long bones of legs and arms that make a person tall.

In the beginning, it is observed that the girls grow faster than boys, but on reaching 18 years of age, both gain their maximum height. Also, the rate of growth in height differs individually.

The height of an individual depends on the genes inherited from parents.

The calculation for full height (cm): The average rate of growth in the height of boys and girls with age given in the chart helps in calculating the full height of the individuals.

Age in Years	% of full height	
	Boys	Girls
8	72%	77%
9	75%	81%
10	78%	84%
11	81%	88%
12	84%	91%
13	88%	95%
14	92%	98%
15	95%	99%
16	98%	99.50%
17	99%	100%
18	100%	100%

Calculation of Height

$$\frac{\text{Present height (cm)}}{\% \text{ of full height at this age}} \times 100$$

2. Change in Body Shape:

In boys, at the age of puberty, shoulders generally broaden as a result of growth. In boys, the muscles of the body grow prominently than in girls.

In girls, the region below the waist becomes wider. The muscles also comparatively grow less.

3. Change in Voice

During puberty, it is being noticed that the voice of boys starts cracking and their voice box or larynx starts to grow.

Adam's apple: The increase in the size of the voice box in boys is seen as a prominent protrusion in the neck. This protrusion is called Adam's apple.

Moreover, girls will usually have a high pitched voice while the boys will have a deeper voice.



Adam's apple

4. Increased Activity of Sweat and Sebaceous Glands:

The secretion of sweat glands and sebaceous glands (oil glands) increases during puberty, resulting in pimples or acne.

5. Development of Sex Organs:

In males, the testes and penis develop completely. Tests start producing sperms. In girls, ovaries enlarge and eggs begin to mature. Ovaries start releasing mature eggs (ova).

At puberty, individuals reach mental, intellectual, and emotional maturity.

6. Reaching Mental, Intellectual, and Emotional Maturity:

The brain becomes more active and so more learning takes place.

Mental and intellectual maturity is seen.

7. Secondary Sexual Characters:

Hair growth is seen in the under the arms and the region above the thighs or pubic region in females

Shoulders get broad and the chest gets widened in males. The waist gets wide and the hips get narrow in females.

The development of breasts takes place in females. Starting of the menstrual cycle.

Mood swings are seen in males as well as females. Mental and emotional maturity is attained by both sexes. The brain gets more active and has the capability of learning more.

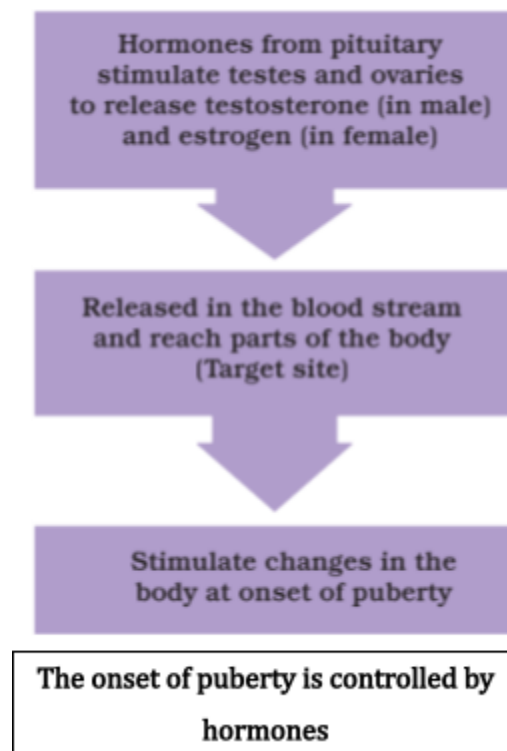
Hormones:

Hormones are the chemical substances secreted by endocrine glands for proper functioning taking place during adolescence in the human body.

These glands release hormones directly into the bloodstream to reach a particular body part known as the target site.

The male hormone called testosterone is secreted by the testes at the onset of puberty and causes the development of facial hair, chest hair, etc.

At the onset of puberty in girls, ovaries secrete female hormones or oestrogen which makes the breast develop. Their secretion is under the pituitary endocrine gland.



The reproductive phase lasts for a much longer time in males than in females. The uterine wall in females prepares itself to receive the developing fertilized egg. In case there is no fertilization, the thickened lining of the uterine wall breaks down and goes out along with blood. This bleeding in women is called menstruation which occurs once in about 28 to

30 days. The sequence of events starting from the release of an egg and till the egg gets removed is called the menstrual cycle.

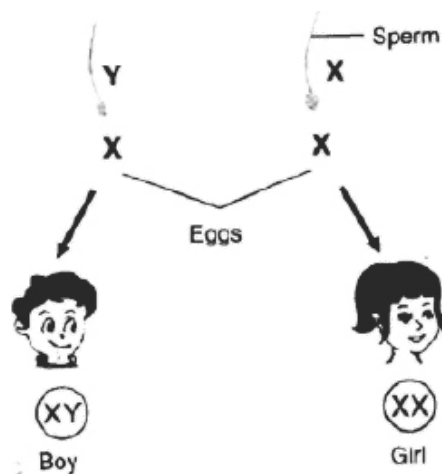
Menarche: The first menstrual flow which begins at puberty is known as menarche.

Menopause: At 45 to 50 years of age, the menstruation cycle stops. The stoppage of menstruation is known as menopause.

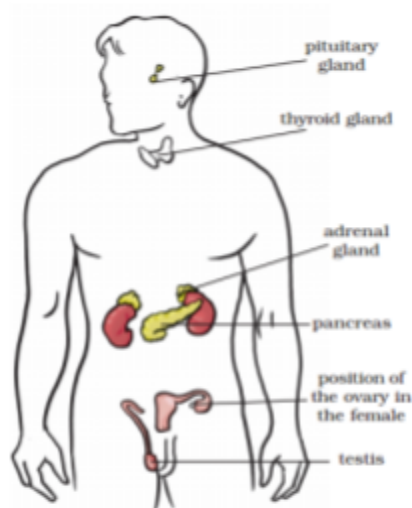
Sex chromosome:

The thread structures present inside the nucleus of every cell are called chromosomes. All human beings have 23 pairs of chromosomes in the nuclei of their cells. Two chromosomes out of these are the sex chromosomes known as X and Y. A female has two X chromosomes whereas a male has one X and one Y chromosome.

The sex of the unborn child depends on whether the zygote has XX or XY chromosomes.



Hormones Other Than Sex Hormones:



Position of Endocrine Glands in the Human body

S. No.	Name of Endocrine gland	Hormone secreted	Functions
1.	Pituitary gland	(i) Growth hormone (ii) Other Hormones	Regulates normal growth of a person To regulate functioning of (a) Thyroid gland (b) Adrenal gland (c) Production of testosterone by testes and estrogen by ovaries.
2.	Thyroid gland	Thyroxine Pancreas	Controls body metabolism. Lack of thyroxine causes Goitre. Sufficient iodine in diet prevents goitre.

3.	Pancreas	Insulin	Control carbohydrate metabolism. Lack of insulin secretion causes Diabetes.
4.	Adrenalin	(i) Hormone To keep salt Balance (corticoids) (ii) Adrenalin	Maintains correct balance of salt-water in the blood. It helps the body to adjust to stress due to anger, worry or embarrassment.

Thyroxine:

It is released by the thyroid glands and is present in the front part of the neck. In case of improper secretion of thyroxine, it leads to swelling of the throat, a disease called goitre.



Goitre Disease

Insulin:

It is a hormone, which is responsible for controlling the sugar level in our body, secreted by the pancreas.

If insulin is not secreted properly, then blood sugar levels might increase and can result in a condition called diabetes.

Adrenaline:

It is released from a pair of adrenal glands at the top of the kidneys. Adrenaline is called as "fight-flight hormone".

It is the hormone of emergency. It also helps in balancing the salt level in the blood.

Role of Hormones in Completing the Life History of Insects and Frogs:

The life span of insects can be categorized into four stages: Egg, Larva, Pupa, and Adult.

Metamorphosis: The change from larva to adult is called metamorphosis. In insects, metamorphosis is controlled by insect hormones. In frogs, the metamorphosis from tadpole to adult frog is controlled by the thyroxine hormone which is produced by the thyroid gland. Thyroxine production requires the presence of iodine in water.

Reproductive Health:

1. Balanced Diet: During adolescence, there is a need for a properly balanced diet. A proper amount of carbohydrates, protein, fat, vitamins, and minerals must be included in the food.



2. Personal Hygiene: Many physical and psychological changes are observed during adolescence. If good hygiene is not undertaken, it may result in skin diseases. And Girls need special attention during the menstrual period.

3. Physical Exercise: Physical exercise not only helps in making a strong body but also helps in proper energy utilization.



4. Say 'NO' to Drugs: During teenage, anyone might get affected by the negative energies surrounding him. At such times, falling for drugs can ruin your life.



1. HIV (Human Immunodeficiency Virus):

AIDS (Acquired Immunodeficiency Disease) is caused due to this virus. It is an incurable disease as yet no medicine can cure it. It might spread due to sexual contact, because of infected needles

and from an infected mother to her unborn child.

Hence, prevention is the only way to keep away from this dangerous disease.

