

Revision Notes for Class 8 Science

Chapter 7 - Reaching The Age of Adolescence

1. When a child reaches puberty, their bodies begin to develop and change in preparation for adulthood. After puberty, humans become capable of reproducing. Adolescents are youngsters who are between the ages of 11 and 19.

2. Changes during Puberty:

a. Increase in Height: The bones in the legs and arms lengthen, making the person tall and thin.

b. Changes in Body Shape: Boys' bodies become more muscular, and their shoulders widen. The body of a female has curves in some areas, and the area below the waist becomes wider.

c. Change in Voice: The increased growth of the larynx causes the voice to become hoarse and heavy in boys (voice box). The voice of a female becomes higher pitched and shriller.

d. Sweat and sebaceous glands: They become more active, sweating and producing more oil. The increased activity of sebaceous glands or oil glands causes pimples or acne.

e. Emotional aspects begin to emerge.

f. Mental and intellectual development has reached a pinnacle point.

3. The sex organs mature and become fully functional. The testes begin to produce male gametes known as sperms. In a 28-day cycle, the ovaries mature and release one mature ovum.

4. During adolescence, children develop height. Children grow around 2.5 inches (6 to 7 centimetres) per year, which is a very consistent rate. When it comes to weight gain, children gain 4–7 pounds.

5. Puberty: It is at this point that the sex organs begin to function. It causes changes in the body and growth in the reproductive organs. The beginning of puberty is the start of adolescence. Puberty begins much earlier in girls, between the ages of 8 and 13, whereas it begins in boys between the ages of 10 and 14 and lasts for 2 to 4 years.

6. Hormones regulate the start of puberty and the maturation of reproductive organs. Hormones are secretions of the endocrine glands that enter the bloodstream directly.

7. Growth hormones and hormones that cause other glands to secrete hormones, such as the testes, ovaries, thyroids, and adrenals, are secreted by the pituitary gland. Insulin is produced by the pancreas, thyroxine is produced by the thyroid, and adrenaline is produced by the adrenals.

8. The male hormone is testosterone, and the female hormone is estrogen. In females, the uterine wall prepares to receive the developing fertilised egg. If there is no fertilisation, the uterine wall's thicker lining breaks down and is expelled along with the blood. Menstruation is the term for this.

9. A zygote is formed when sperm and ovum fuse together. The sex chromosomes of sperm determine the gender of a kid. Each cell in the human body has 23 chromosome pairs. A pair of chromosomes make up the sex chromosomes. XY chromosomes are found in males, while XX chromosomes are found in females. If an X-chromosome-carrying sperm fertilises an ovum containing an X-chromosome, the resultant baby is a female. If a sperm with the Y chromosome fertilises an ovum with the X chromosome, the child will be a boy. As a result, males are in charge of determining the gender of newly produced newborns.

10. Reproductive Health:

- a. During adolescence, it is critical to eat a well-balanced diet and maintain personal hygiene.
- b. It's critical to keep your private regions clean in order to avoid illness. During puberty, the activity of sweat glands increases, releasing foul odours from the body. As a result, bathing is required on a regular basis.
- c. Physical activity helps to keep the body fit and healthy by releasing a lot of perspiration. Self-confidence and a healthy lifestyle are the best ways to combat peer pressure.

During puberty, the growth of the body is an important part. The rapid growth is due to the two main types of hormones, i.e. sex hormones and growth hormones. Some of the prominent changes, which take place during puberty, are:

- a. Increase in Height:** A sudden increase in height is the most prominent change during puberty. The height increases faster in girls than boys and both reach the maximum height at the age of 18. The growth rate in height differs from person to person. It is also to be noted that the height of an individual depends upon the genes inherited from parents. However, it is important to have a nutritious diet for the proper growth of bones, muscles, and other parts of the bones during growing periods.
- b. Change in Body Shape:** During adolescence, a change takes place in the body. These changes vary from boys to girls. In boys, the shoulders become broader and the chest becomes wider. The muscles of the body grow more prominently.
- c. Change in the Voice:** At puberty, the voice box or the larynx begins to grow. It is bigger in boys and can be seen as a protruding part of the throat called Adam's apple. In girls, the larynx is smaller and hardly visible from the outside.

d. Increase Activity of Sweat and Sebaceous Glands: During puberty, there is an increase in the activity of sweat and sebaceous glands, which results in the development of acne and pimples in boys and girls.

e. Development of Sex Organs: The reproductive system starts functioning at puberty due to the complete growth and development of sex organs in boys and girls.

f. In boys, the male sex organs like the testes and penis develop completely. The testes start producing sperm.

g. In girls, the ovaries enlarge and eggs begin to mature. Ovaries start releasing mature eggs.

h. Reaching Mental, Intellectual, and Emotional Maturity: In this period of adolescence, a person develops his way of thinking, intelligence, and emotions. The person becomes more independent and self-conscious. He becomes more capable of planning, analysing, and exchanging views and ideas with others. This is the time in life when the brain has the highest capacity for learning. There are a lot of emotional changes during the phase of puberty. The person has to cope up with the rapid changes in the body.

Secondary Sexual Characters

Sexual characteristics are physical or behavioural qualities of a living being, which indicate its biological sex. These characters include:

- a. Primary sexual characteristics are the sex organs that are used for reproduction, with which a person is born. For example: testes in males and ovaries in females.
- b. Secondary sexual characteristics are the features that differentiate the two sexes of a class of organisms and develop during puberty.

Following are some of the sexual characteristics that develop in males and females:

Boys develop facial hair like beards, moustaches, and hair under their armpit, on the chest, and on the pubic parts. They develop muscles and their shoulders become broad. Their weight increases and their voices become hoarse.

In girls, breasts develop and enlarge. Their hips become broader and the pelvic area widens. Girls go through a menstrual cycle and the voice becomes high-pitched. They also develop hair in their armpits and in the pubic areas.

Hormones

The changes, which occur during the phase of adolescence, are controlled by hormones, i.e. testosterone in males and oestrogen in females. Hormones are the chemical substances that are released into the bloodstream to reach the target site, secreted by the endocrine glands, for control and coordinating the functions of many organs of the body.

Role of Hormones in Initiating Reproductive Function

Puberty starts because of a sudden increase in the production of hormones. The endocrine glands like testes in males and ovaries in females secrete sex hormones that bring about changes at puberty and make the reproductive glands function. The production of testosterone and oestrogen is controlled by another hormone secreted by the pituitary gland.

Reproductive Phase of Life in Humans

After reaching the stage of puberty, the testes and ovaries of adolescents begin to produce gametes and thus they become capable of reproduction.

The reproductive phase in a female's life begins when she reaches puberty age, within 10-12 years of age. It continues till the age of 45-50 years.

With the onset of puberty, the ova begins to mature in the ovaries of a woman and one mature ovum is released once every 28-30 days. This process of releasing an egg by an ovary is called ovulation. During this period, the uterus wall becomes thick so as to receive the

fertilized egg. The fertilized egg then gets implanted in the thick uterus wall, thus resulting in pregnancy.

If fertilisation does not occur, then the released egg and the lining of the uterus wall get discharged in the flow of blood known as menstruation.

The reproductive life of a woman starts at menarche (the first menstrual flow) and ends at menopause (when the menstrual cycle stops at the age of 45-50 years of age).

Determination of Sex of the Baby

The sex of the unborn child depends on the nature of the sex chromosomes present in the fertilized egg. There are twenty-three pairs of chromosomes in the nucleus of each human cell. Out of these chromosomes, one pair is the sex chromosomes and they are of two types: X-chromosomes and Y-chromosomes. There are two X chromosomes in females whereas males have either X or Y chromosomes.

The sex of the child depends on how the fertilization happens. If the sperm carrying X chromosomes fertilizes with the egg containing X chromosomes then the zygote formed will have two X chromosomes resulting in a female child. If the sperm carrying Y-chromosomes fertilizes with the egg containing X chromosomes then the zygote formed will have XY chromosomes resulting in a male child.

Role of Hormones in Insects and Frogs

Hormones play a significant role in the lifecycle of an insect and the frog. For example, a caterpillar goes through many stages to become a butterfly. Similarly, a tadpole goes through many stages to become a frog. These changes that take place to complete a full cycle are called metamorphosis.

Reproductive Health

Health is regarded as physical and mental well-being. As we all know about the rapid changes in an adolescent, the growing children need special attention during their growing stage.

Nutritional Needs Of The Adolescents

Each individual should eat a balanced diet in order to stay healthy but it is more important for an adolescent to plan his diet carefully. A balanced diet includes the right proportion of carbohydrates, vitamins, fats, proteins, minerals, fibre, and water.

Personal Hygiene

Besides eating a balanced diet, it is important to protect ourselves from diseases and illness by keeping our body and surroundings clean. The adolescents must adopt the practice of maintaining personal hygiene like bathing every day, washing hands before and after meals, not defecating in the open field, and girls taking care of cleanliness during their menstrual cycle.

There are chances of catching bacterial infections if adolescent boys and girls do not maintain personal hygiene.

Physical Exercise

One must exercise regularly to keep his body fit and fine. All adolescent girls and boys must be active and incorporate brisk walking, running, jogging, cycling, swimming, and dancing in their daily routine.

‘NO’ to Drugs or Medicines

We should avoid taking medicines or drugs unless prescribed by a doctor because several medicines have adverse side effects and have specific dosage levels, which if not followed properly may harm the body. Drugs can be addictive too and can ruin our health and happiness.