

UNIT : 20 - REACHING THE AGE OF ADOLESCENCE

Class : VIII

Subject : Science

I. Choose the best answer.

- Adolescence is the period of life between _____ years of age.
a) 10 to 16 b) 11 to 17 **c) 11 to 19** d) 11 to 20
- The period at which an organism attains sexual maturity is called _____.
a) puberty b) adolescence c) growth d) maturity
- During puberty, the region below the waist become wider in _____.
a) boys b) girls **c) Both a and b** d) None of these
- Adam's apple is the growth of the _____.
a) pharynx b) thyroid **c) larynx** d) parathyroid
- Many adolescent boys and girls get pimples on face, due to the secretions of _____ gland.
a) sweat **b) sebaceous** c) sweat and sebaceous d) None of these
- The sperm is produced by _____.
a) penis b) ovary c) uterus **d) testes**
- _____ are the chemical substances, secreted by endocrine glands.
a) Hormones b) Enzymes c) Proteins d) Fatty acids
- Androgen production is regulated by _____.
a) GH hormone **b) LH hormone** c) TSH hormone d) ACTH hormone
- During menstruation, the progesterone level is _____.
a) decreased b) increased **c) ceased** d) normal
- _____ intake needs to be increased to prevent osteoporosis in later life.
a) Potassium b) Phosphorus c) Iron **d) Calcium**

II. Fill in the blanks.

- Estrogen** is secreted by the ovaries of female.
- The hormones secreted by the gonads are controlled by **Anterior pituitary**
- Milk secretion during lactation is controlled by **prolactin** hormone.
- The male and the female gamete fuse together and form **zygote**
- The first menstrual flow begins at puberty and it is termed as **menarche**
- Menstruation** usually occurs 14 days after ovulation.
- Balanced diet** includes protein, carbohydrates, fats and vitamins in requisite proportion.
- Iodine** helps to prevent thyroid gland related diseases.
- Iron deficiency leads to **Anaemia**
- In women fertilization takes place at **Fallopian tube**

III. State true or false. If false, correct the statement.

1. There is a sudden increase in the height of both boys and girls during puberty. **True**
2. The release of ovum from the uterus is called ovulation. **False**
3. During pregnancy, the corpus luteum continues to grow and produces large amount of estrogen and progesterone. **True**
4. Making use of disposable napkins or tampons may increase the chances of infections. **False**
5. Using clean toilets for defecation is a good practice. **True**

IV. Match the following.

- | | | |
|-----------------|---|--------------------------|
| 1. Puberty | - | Sexual maturity |
| 2. Adam's apple | - | Change in voice |
| 3. Androgen | - | Muscle development |
| 4. ICSH | - | Testosterone |
| 5. Menopause | - | at 45 to 50 years of age |

V. Answer briefly.

1. What is adolescence?

- The term adolescence is derived from the Latin word 'adolescere' meaning 'to grow' or 'grow to maturity'.
- Biologically it is a physical transition marked by the onset of puberty and termination of physical growth in an individual.

2. List out the changes which occur during puberty.

Puberty transform the body of a child into that of an adult. These changes are:

- Changes in body size
- Changes in body proportion
- Development of primary sex characteristics
- Development of secondary sex characteristics.

3. What do you mean by secondary sex characteristics?

Secondary sex characteristics are the physical features which distinguish male from female.

4. What is fertilization?

The fusion of the sperm and egg is called fertilization.

5. Explain Menarche.

- The first menstrual flow begins at puberty and is termed menarche.
- It is the beginning of adolescence, during which mental and emotional maturation occurs and physical growth becomes pronounced.

6. Explain the process of pregnancy.

- After ovulation, the ovum reaches the fallopian tube and fertilization takes place.
- The fertilized egg undergoes development and it is implanted in the uterus.
- The corpus luteum continues to grow and produces large amount of progesterone.
- This results in pregnancy. Normally, it lasts for 280 days, at the end of which parturition (child birth) takes place.

7. Explain the importance of cleanliness during the time of menstrual cycle in girls.

- Girls should take special care of cleanliness during the time of menstrual cycle.
- Making use of disposable napkins or tampons may reduce chances of infections.
- It should be changed frequently depending upon the menstrual flow.

8. How is adolescence differ from childhood?

- The period of life from birth till 12 years is also childhood. Adolescence begins from age of 12 -13 years.
- Lot of changes in height, weight, sex organs, muscle mass etc, occur in adolescence.

VI. Answer in detail.

1. What are the physical changes that occur in boys and girls during adolescence?

Secondary sex characteristics are the physical features which distinguish male from female.

The following are the secondary sex characteristics of boys.

a. Hair

Immediately after the development of primary sex characteristics, pubic hair appears

followed by axillary and facial hair.

b. Skin

The skin becomes coarse and the pores in the skin enlarge.

c. Glands

The oil producing glands in the skin enlarge and due to this acne may appear on the faces.

d. Muscle

The strength of the muscle increases and it gives shape to arms, legs and shoulders.

e. Voice

During this period voice changes occur and the voice becomes husky. Then its pitch drops and the volume increases.

Girls show the following secondary sex characteristics at the time of puberty:

a. Hips

Due to the enlargement of the pelvic bone and the development of subcutaneous fat, the hip becomes wider and rounder.

b. Breast

After the enlargement of hips, the breasts begin to develop during this time.

c. Hair

Pubic hair appears followed by axillary and body hair on the limbs.

d. Muscles

Increase in muscles takes place which gives shape to shoulders, arms and legs.

e. Voice

Voice becomes shrill and voice breaks are rare among girls.

f. Skin

The skin becomes coarser and the pores enlarge as in the case of boys.

g. Gland

Oil producing glands become active causing acne on the face.

2. Explain the role of hormones in reproduction.

The primary hormones that regulate reproduction are the steroids such as androgens, estrogens and progesterone. which have masculinizing, feminizing and gestational effects respectively.

These hormones are secreted from the gonads which are regulated by the anterior pituitary (adenohypophysis).

Follicle Stimulating Hormone (FSH):

FSH in a female influences the development of the Graafian follicle and secretion of estrogens. In a male, it is necessary for the development of seminiferous tubules, and for spermatogenesis.

Luteinizing Hormone (LH):

In a female, it is the hormone necessary for ovulation, and the secretion of the luteal hormone progesterone, and for the final maturation of the Graafian follicle.

In a male, it stimulates the interstitial (Leydig) cells of testes and the secretion of testosterone, and is referred to as the Interstitial Cell Stimulating Hormone (ICSH).

Prolactin (PRL) or Lactogenic Hormone

The main function of this hormone is milk secretion during lactation.

Oxytocin Hormone

Oxytocin causes expulsion of milk from the breast and it is also involved in the contraction of smooth muscles of uterus during child birth.

3. Briefly describe the menstrual cycle.

The beginning of the menstrual cycle marks the onset of puberty in human females. Menstruation occurs if an ovum released by the ovary of a woman is not fertilized during ovulation. This is described below.

1. When a girl reaches puberty at the age of about 10, the sex hormones released into her blood cause some of the ova (or egg cells) in her ovaries to become mature (or ripe).

2. Usually one mature ovum (or egg) is released from one of the ovaries into the oviduct once in every 28 days. This is called ovulation.

3. Before ovulation (or release of ovum), the inner wall of uterus becomes thick and spongy, and full of tiny blood vessels to receive the fertilized ovum.

4. If the ovum does not get fertilized then the thick and soft inner lining of uterus breaks. So, the thick and soft inner lining of uterus along with the blood vessels and the dead ovum comes out of the vagina in the form of a bleeding called menstruation.

5. Menstruation usually occurs 14 days after ovulation and usually lasts for about 3 to 5 days.

6. After menstruation is over, the inner lining of the uterus starts building up again so that it may become ready to receive the next ovum.

7. If the ovum does not get fertilized even now, then menstruation takes place again. This cycle of menstruation is repeated again and again in women after every 28 days. The menstrual cycle is controlled by hormones.

Menstruation stops temporarily when the ovum gets fertilized and the woman gets pregnant.

This is because, in this case the thick and soft lining of the uterus containing lot of blood vessels is needed for the growth and development of the fertilized ovum to form a baby.

Menstruation restarts after the birth of the baby. Menstruation also stops due to nutritional deficiencies, low body weight, stress, eating disorder, excessive weight gain etc.

4. Explain the nutritional needs of adolescence in brief.

- Adolescence is a stage of rapid growth and development.
- Balanced diet is very much important during adolescence. Balanced diet includes proteins, carbohydrates, fats and vitamins in requisite proportions.
- very good amount of proteins and carbohydrates is necessary during this growth period. Apart from that, adolescents need the following dietary components.

Minerals:

Since there is an increase in skeletal mass and blood volume during adolescence, the body needs calcium, phosphorus and iron.

Calcium:

Calcium intake needs to be increased to prevent osteoporosis in later life. It is present in milk and milk products or other equivalents.

Iodine:

It helps to prevent thyroid gland related diseases.

Iron:

- Iron builds blood and iron-rich foods such as green leafy vegetables, jaggery, meat, dates, fish, chicken, citrus, Indian gooseberry (Nelli) and whole pulses are good for adolescents.
- Lack of iron in the diet results in anemia.
- In boys, iron deficiency occurs due to muscle spurt whereas in girls it occurs due to menstruation in addition to the muscular growth.

VII. Higher Order Thinking Questions.

1. What can you suggest to your classmates to keep himself / herself clean and healthy?

- Shower or bath daily.
- Always wash your hands before and after meals.
- Keep fingernails clean and dipped.
- Wash your teeth and mouth before and after each meal.
- Avoid touching your face, nose or mouth while preparing food.
- Avoid coughing or sneezing around food and close your mouth by using hand kerchief while you cough in public places.
- If you want to taste the food, use a clean spoon.
- Change your clothes regularly and wash them cleanly, especially undergarments.
- Do not defecate in open field. Use clean toilets for defecation.
- If you are not well, avoid self-medication, consult a doctor.
- In case of girls, menstrual hygiene can be explained to them.

2. Adolescence is the energistic stage. What health and good habits you want to develop?

- Healthy and good habits that we should develop during adolescence are:
- Eat balanced diet and avoid junk food to prevent obesity.
- Regular physical exercise which helps to build our body.
- Keep ourselves clean by bathing twice a day, cutting hair, trimming nails, wearing clean cloths.
- Keep away from abusive substances, drugs smoking and any other bad habits.
- Observe menstrual hygiene.
- Be aware of problems related to adolescence and take care of one's physical and mental health.