**BASIC SCIENCE JSS 2**

**THIRD TERM**

**WEEK**  **TOPIC**

1. Reproductive Health
2. Abstinence
3. Chemicals
4. Chemicals (Safety Measures)
5. Drug Abuse
6. Crude oil and Petrochemicals

7.&8 Family traits and Genetic Counseling

9. Environmental Hazard

10. Revision

**REFERENCE**

Precious Seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK 2

**WEEK ONE**

**Reproductive Health and Genetic Counseling**

Genetic Counseling is a comprehensive process aimed at informing individuals who either have a genetic condition or are at risk of one. It involves discussing the implications of the disorder, the probability of its occurrence, and the potential strategies for managing or preventing it. It's important to note that "genetic" doesn't necessarily equate to "hereditary." The term simply signifies that the disorder is rooted in genetic material, be it at the chromosomal or genetic level, due to mutations. Once a mutation is present, especially if it's constitutional (affecting all cells), it can be inherited, making the disorder hereditary.

**The Four Aspects of Genetic Counseling**

1. Specific Diagnosis: Determining the precise nature of the genetic disorder.

2. Risk Assessment: Estimating the likelihood of developing the disorder and/or passing it on to offspring.

3. Practical Guidance: This includes recommendations for specialized medical examinations, health care professionals for therapies, and coordinating prenatal and diagnostic tests.

4. Emotional Support: Providing emotional assistance throughout the counseling process.

**Importance of Genetic Counseling Before Marriage**

1. Ensuring Genetic Compatibility: It helps confirm that both partners don't carry genetic anomalies that could lead to offspring with health issues.

2. Preventing Genetic Diseases: Given the rising number of children affected by genetic or blood-transmitted diseases, premarital testing is crucial in reducing the incidence of these conditions.

3. Screening for Genetic Conditions: Premarital screening aims to identify and address inherited diseases.

4. Family History: It's especially important if either or both partners have a family history of serious genetic conditions.

5. Carrier Status: If both partners are carriers of the same faulty gene, counseling helps in understanding the risks involved.

6. Environmental Factors: Couples with exposure to environmental agents that may impact genetic health should consider genetic counseling.

7. Chromosomal Abnormalities: If there are concerns about chromosomal issues, genetic counseling can provide insights and guidance.

**Breastfeeding and Its Significance**

Breastfeeding offers a multitude of advantages for both infants and mothers. Some key benefits include:

* - Enhanced Immunity: Breastfed babies have improved resistance to infections, leading to fewer illnesses and hospitalizations.
* - Reduced Allergy Risk: Breastfeeding lowers the risk of allergies and lactose intolerance in infants.
* - Sterile Nutrition: Breast milk is inherently sterile, reducing the likelihood of infections.
* - Digestive Health: Breastfed babies experience fewer instances of nappy rash, thrush, stomach upsets, and constipation.
* - Oral Development: Breastfeeding promotes proper jaw and teeth development.
* - Cognitive Advantages: Breastfed infants tend to have higher IQs, fostering early brain development.
* - Emotional Bonding: The process strengthens the emotional connection between mother and child.
* - Long-Term Health: Breastfed babies face a reduced risk of malnutrition, obesity, and heart disease compared to formula-fed infants.

**Dispelling Myths About Breastfeeding**

Myth: If babies feed frequently, it implies they aren't receiving sufficient milk.

Fact: Breast milk is readily digestible, causing babies to become hungry sooner compared to formula-fed infants. Frequent feeding, every two to three hours, is entirely appropriate for breastfeeding newborns.

Myth: Allowing the breast to "rest" can increase milk production.

Fact: Contrary to the myth, regular nursing leads to increased milk production. Interrupting the nursing schedule to allow the breast to "rest" may actually diminish milk supply.

This myth arose from the idea that skipping a feeding or pumping during the day would lead to more milk production at night. However, the consequence is a reduction in milk supply the following day. The key to maintaining a steady milk supply is consistent milk expression. Ideally, nursing should occur at least nine to ten times daily to support milk production.

Myth: Formula-fed babies sleep better.

Fact: Research suggests that formula-fed babies do not necessarily sleep better, although they might sleep longer. Formula milk takes longer to digest, resulting in extended intervals between feedings. Breastfed babies typically start sleeping longer around four weeks of age, ultimately achieving a similar sleep pattern to formula-fed babies.

Myth: Nursing babies should never be given an occasional bottle, as it might lead to confusion and decreased breastfeeding.

Fact: Babies suck on a bottle nipple but suckle at the breast, and the differentiation between the two actions rarely confuses an infant. Introducing your baby to a bottle between two to six weeks of age, especially if you plan to return to work, can be beneficial.

Offer the bottle for one or two feedings a day, using your own expressed breast milk. Maintain close physical contact with your baby to emphasize the bonding aspect. It's not just about feeding but also the connection.

Myth: Breastfeeding alters the size and shape of your breasts and reduces sensitivity.

Fact: While pregnancy may bring some changes to the appearance and feel of your breasts, breastfeeding itself does not cause significant alterations beyond that. In fact, breastfeeding can offer protective benefits to breast health, potentially reducing the risk of breast cancer in the long term.

Myth: Never wake a sleeping baby for breastfeeding.

Fact: Most of the time, a baby will naturally wake every two and a half to three hours, indicating they are ready to eat. However, there might be occasions when a baby feeds vigorously for an extended period, known as "cluster feedings," followed by a more extended sleep interval.

It's acceptable to allow them to sleep a bit longer than usual, but it's important to avoid more than one four-and-a-half-hour period without feeding. If a baby consistently sleeps through feeding times, it's advisable to wake them for their scheduled feeds. Maintaining a feeding schedule is crucial for a baby's nourishment and milk supply.

Myth: Breastfeeding serves as a foolproof contraceptive method.

Fact While breastfeeding can be effective as a form of birth control, it is not infallible. Some families have experienced babies born closely spaced despite breastfeeding. Nonetheless, experts believe that breastfeeding is about 98% effective, similar to other forms of contraception. The hormones involved in breastfeeding typically suppress ovulation, reducing the chances of conceiving for up to 14 or 15 months following childbirth.

**EVALUATION**

1. State five importance of breast feeding
2. What is breast feeding?

**GENERAL EVALUATION**

1. What is genetic counseling?

2.       What are the four aspects involved in giving genetic counseling?

1. State five importance of breast feeding
2. What is breast feeding?
3. State five importance of genetic counseling before marriage

**WEEKEND ASSIGNMENT**

1. Counseling may be described as the process through which individuals affected by, or at risk for a problem which may be genetic or hereditary, are informed of the consequences of the disorder, of the probability of suffering from or of transmitting it to their offspring. A. Genetic B. Sporadic C. Hereditary D. General
2. Nowadays premarital-------- is considered an important issue, as a result of the increasing in the number of children affected with genetic or blood transmitted diseases. A. testing B. exam C. submission D. counseling
3. Breastfeeding -----------the proper development of baby’s jaw and teeth. A. promotes B. hinders C. inhibit D. negotiates
4. Women who breastfeed have a ---------risk of breast cancer later in life. A. reduced B. observed C. suspecting D. aggravated
5. Similar to other forms of birth control, hormones involved in breastfeeding prevent -------- A. ovulation B. fertilization C. oval window D. pregnancy

**THEORY**

1. State two myths about breast feeding
2. State five importance of genetic counseling before marriage

**WEEK TWO**

**Abstinence: A Comprehensive Perspective**

Definition of Abstinence

Abstinence, in its broadest sense, represents a self-imposed restraint from engaging in activities typically associated with pleasure. This term most commonly alludes to sexual abstinence, but it can also apply to abstinence from alcohol or specific foods. The motivations for abstinence can range from religious and ethical beliefs to pragmatic considerations. Furthermore, abstinence can extend to drug use, such as refraining from smoking. It takes on various forms, including temporary or partial abstinence, as seen in fasting, and can be either voluntary, driven by personal convictions, or involuntary, arising from social circumstances.

Varieties of Abstinence

1. Fasting: Deliberate abstention from some or all food and drink for a designated period.

2. Vegetarianism: Adherence to a diet that excludes meat, encompassing various animal products.

3. Smoking Cessation: The conscious effort to discontinue the consumption of smoked substances, particularly tobacco.

4. Teetotalism: The practice of complete abstinence from alcoholic beverages.

5. Sexual Abstinence: Refraining from some or all aspects of sexual activity for a range of motives, including medical, psychological, legal, social, financial, philosophical, moral, or religious considerations.

6. Abstinence in Religious Orders: Prolonged, often lifelong abstinence, primarily linked with philosophical or religious asceticism, sets it apart from premarital chastity.

**Promoting Abstinence: Skills and Behaviors**

1. Tangible Rewards: Offering tangible rewards for verifiable abstinence can serve as an effective incentive. Individuals are more inclined to maintain desirable behaviors when rewarded regularly, rather than focusing solely on long-term goals.

2. Incentives in Addiction Treatment: Incentives, such as rewards or privileges, can extend abstinence during addiction treatment. Studies have shown that these benefits can persist for up to a year or two post-treatment.

3. Motivational Incentives: These can play a role in reinforcing multiple healthy behaviors. They have been successful in improving drug abusers' adherence to HIV antiviral medication regimens and promoting activities that support a drug-free lifestyle.

4. Consistent Abstinence: The more an individual maintains continuous abstinence, the greater the likelihood of sustaining future abstinence.

The Imperative for Young People to Abstain from Pre-Marital Sex

1. Adherence to God's Laws: Engaging in pre-marital sex is viewed as contravening God's laws and dishonoring Him, as evidenced by biblical references to fornication.

2. Physical Risks: Pre-marital sex carries significant physical risks, including the transmission of diseases and illnesses, making it a risky lifestyle choice.

3. Emotional Hazards: Establishing a physical and emotional bond without a spiritual commitment can lead to emotional challenges, often overshadowing the physical aspect.

4. Spiritual Consequences: Engaging in pre-marital sex can lead to spiritual consequences, including grieving the Holy Spirit and offending a holy God, thereby forfeiting God's best.

5. Fulfillment Shortcomings: Pre-marital sex often leads to dissatisfaction, both physically and emotionally, as it is not representative of God's original intent for intimacy.

6. Bonding Without Commitment: Engaging in pre-marital sex creates a bond without commitment, which can result in resentment, bitterness, and feelings of being used.

7. Trust Erosion: Establishing trust in a marriage is best achieved by maintaining purity before marriage, emphasizing commitment to both Christ and a future spouse.

8. Resentment and Frustration: Pre-marital sex can lead to resentment and frustration, often causing feelings of being used, particularly when the bond lacks commitment.

9. Empty Pursuit: Pre-marital sex can leave individuals feeling empty, searching for genuine love, as physical intimacy alone doesn't create a loving, committed relationship.

10. Devaluation of Future Intimacy: Engaging in pre-marital relationships may devalue the future intimacy of marriage, as it disrupts the unique intimacy that "belongs to the two."

11. Preventing Ultimate Intimacy: Pre-marital relationships prevent the achievement of the purest and most fulfilling marital relationship, which remains untouched by prior experiences.

12. Unfulfilling Sexual Experiences: Pre-marital sex sets individuals on a path of unfulfilling sexual relationships, creating a downward spiral of disappointment.

13. Amplification of Desires: It amplifies sexual desires and makes them insatiable, placing hormones in control of life and decisions.

14. Loss of Control: Allowing the flesh and hormones to dictate life choices diminishes one's autonomy and self-control.

15. Impact on Family Formation: Pre-marital sex can lead to children born without strong family foundations, as the concept of family is founded on commitment and lifelong love.

16. Abortion Implications: Illicit relationships can result in unwanted pregnancies, contributing to the abortion industry.

17. Unsafe Practices: Despite cultural messaging, safe sex is best defined as a committed relationship between one man and one woman in marriage for life.

18. Challenge to God's Plan: Engaging in pre-marital sex reduces God's gift of love and family to a mere fleeting pleasure quest, circumventing His intended plan.

19. Unfulfilled Sexual Relationships: Pursuing pre-marital sex sets individuals on a course of unsatisfying sexual experiences, leaving them perpetually unfulfilled.

20. Dilution of Marriage and Family Significance: Premarital relationships trivialize the sanctity of marriage and family, turning them into self-centered pleasure-seeking pursuits.

**EVALUATION**

1. Mention five skills and behaviour that promotes abstinence
2. State seven reasons why young people must abstain from pre-marital sex.

**REASONS WHY YOUNG PEOPLE ENGAGE IN PRE-MARITAL SEX**

1. Family characteristics.i.e educational status of the parents and their positions.
2. Peer influence I.e. experience of pre-marital sex among the youth by sexual behaviour
3. Smoking and alcohol consumption.
4. Individual characteristics.i.e
5. Socioeconomic development of the parents.
6. Behaviour towards the virginity of male and female

**FACTS AND MYTHS ABOUT SEXUAL ABSTINENCE**

1. Comprehensive sexuality education encourages youth to have sex.

FACT Research clearly demonstrates that comprehensive sexuality education programs can help young people delay sexual initiation.

1. MYTH Comprehensive sexuality education disregards values and morals.

FACT Comprehensive sexuality education incorporates values and cultural sensitivity**.**

1. MYTH Comprehensive sexuality education programs undermine parental/family

authority.

FACT Multiple polls indicate that an overwhelming majority of parents support the

provision of comprehensive sexuality education in schools.

1. MYTH Comprehensive sexuality education teaches the mechanics of sex to young

children.

FACT Comprehensive sexuality education provides age- and developmentally appropriate information and skills to help young people delay sexual initiation and to protect themselves when they do become sexually active.

1. MYTH Comprehensive sexuality education programs do not promote abstinence.

FACT Evaluation of comprehensive sexuality education programs showed that were successful at helping young people to delay sexual initiation.

1. MYTH Condoms are not effective.

FACT According to the U.S. Centres for Disease Control and Prevention, condoms are highly effective in preventing HIV and very effective in preventing  most STIs, when used consistently and correctly.

1. MYTH Abstinence-only-until-marriage programs work

FACT A five-year study mandated by the U.S. Congress determined that abstinence only-until-marriage programs were not effective.

1. MYTH Comprehensive sexuality education programs do not promote abstinence

FACT Evaluation of comprehensive sexuality education programs showed that were successful at helping young people to delay sexual initiation.

1. MYTH Abstinence-only-until-marriage programs work.

FACT A five-year study mandated by the U.S. Congress determined that abstinence only- until-marriage programs were not effective.

**GENERAL EVALUATION**

1. Mention five skills and behaviour that promotes abstinence

2.     State seven reasons why young people must abstain from pre-marital sex.

1. Define Abstinence
2. Mention five types of abstinence
3. State three reasons why young people engage in pre-marital sex.

**WEEKEND ASSIGNMENT**

1. ---------extend abstinence during treatment for addiction. A. Incentives B. Deceptive C. Praises D. Encouraging
2. The longer students are continuously abstinent, the greater their chances of maintaining future---------- A. abstinence B. Deceptive C. Praises D. Encouraging
3. -----------is the practice and promotion of complete abstinence from alcoholic beverages. A. Teetotalism B. Teetota C. Teeto D. Teetotal
4. -----------is a self-enforced restraint from indulging in bodily activities that are widely experienced as giving pleasure. A. Abstinence B. Incentives C. Teetotalism D. none
5. -----------is the practice of a diet that excludes meat (including game, marine mammals and slaughter by-products), poultry, fowl, fish, shellfish and other sea creatures. A. Vegetarianism B. Animalitarianism C. Fishrianism D. None of the above

**THEORY**

1. State three reasons why young people engage in pre-marital sex.
2. State three types of abstinence.

**WEEK THREE**

**CHEMICALS**

A substance composed of chemical elements or a substance produced by or used in chemical processes. Chemical classes are groupings that relate chemicals by similar features. Chemicals can be classified by their structure (e.g., hydrocarbons), uses (e.g., pesticides), physical properties (e.g., volatile organic compounds [VOCs]), radiological properties (e.g., radioactive materials), or other factors. The chemical classes identified below are ones used by the Agency for Toxic Substances and Disease Registry (ATSDR) to address hazardous substances.

**Classes of Chemicals**

Based on use

1. Pharmaceutical/cosmetics e.g. Mood stabilizers: lithium and valpromide

* Hormone replacements: Premarin
* Oral contraceptives: Enovid, "biphasic" pill, and "triphasic" pill
* Stimulants: methylphenidate, amphetamine
* Tranquilizers: meprobamate, chlorpromazine, reserpine, chlordiazepoxide, diazepam,

and alprazolam

* Statins: lovastatin, pravastatin, and simvastatin.

Pharmaceutical or a drug is classified on the basis of their origin.

Drug from natural origin: Herbal or plant or mineral origin, some drug substances are of marine origin.

Drug from chemical as well as natural origin: Derived from partial herbal and partial chemical synthesis Chemical, example steroidal drugs

Drug derived from chemical synthesis.

Drug derived from animal origin: For example, hormones, and enzymes.

Drug derived from microbial origin: Antibiotics

* Nuclear; Radioactive means any material having a specific activity greater than 70 Becquerel (Bq) per gram.

E.g. 1. Fission reaction at a nuclear power plant provides enough energy to give electricity to large cities.

2. The fussion reaction in the sun provides our planets with all the energy it needs for all the living organisms to survive.

3. An uncontrolled fission reaction provide the destructive forces of a nuclear bomb.

* Agrochemical or agrichemical; . In most cases, agrichemical refers to the broad range of pesticides, including insecticides, herbicides, fungicides and nematicides. It may also include synthetic fertilizers, hormones and other chemical growth agents, and concentrated stores of raw animal manure.
* Industries- industries that use chemical to production of goods are called chemical based industries; dyes, iodine solutions, methylated spirit, soaps, detergent ,shampoo, cosmetics
* Laboratory ; sodium hydroxide, hydrochloric acid, tetraoxosulphate VI acid, sodium trioxocarbonate IV, potassium hydroxide, ethanol. Etc

1. Based on hazardous nature;

Highly hazardous and toxic

* Explosive(picric acid, 2, 4- dinitro-phenol, organic azides), chloroform, chromic acid, phenol, acetonitrile, methanol, acetone, acetaldehyde burns rapidly. sodium Ignites easily

Based on moderately hazardous and toxic

* sodium hydroxide, potassium hydroxides, organic acids, and oxidizing acids, hydrochloric acid, sulfuric acid, boric acid, nitric acid, bromine

Non hazardous and toxic.

* nitrogen, carbon dioxide,

**EVALUATION**

1. What are chemicals?
2. Mention five hazardous chemicals you know

**GENERAL EVALUATION**

1. What are chemicals?
2. Mention five hazardous chemicals you know
3. What are chemicals?
4. Mention five examples of agrochemicals

**WEEKEND ASSIGNMENT**

1. -----------refers to the broad range of pesticides, including insecticides, herbicides, fungicides and nematicides. A. Agrichemical B. Animals business C. Perochemicals D. None
2. Drug is classified on the basis of their --------- A. origin B. domain C. systemic

D. potency

1. Drug derived from microbial origin are ---------A. antibiotics B. biotics C. hormones D. enzymes.
2. Industries that use chemical to production of goods are called ----------based industries A. chemical B. salt C. sub chemical D. agro allied
3. Radioactive means any material having a specific activity greater than ------- Becquerel (Bq) per gram A. 70 B. 80 C. 60 D. 90

**THEORY**

1. What are chemicals?
2. Mention five examples of agrochemicals

**WEEK FOUR**

**CHEMICALS (SAFETY MEASURE)**

* Follow The Manufacturer's Instructions; , the importance of reading and following the manufacturer's instructions, use and safety information that are on the products that you are purchasing cannot be overemphasized.

Why is it important to follow the manufacturer's instructions?

* The first is that you want your home improvement project to look good and last for many years, when completed.
* The second reason is that, reputable manufacturers stand behind their products, if they are used for the correct application and used or installed properly.
* Follow safety guidelines for chemical storage and handling.
* Be prepared for your work in the laboratory.  Read all procedures thoroughly before entering the laboratory.  Never fool around in the laboratory.  Horseplay, practical jokes, and pranks are dangerous and prohibited.
* Always work in a well-ventilated area.
* Observe good housekeeping practices.  Work areas should be kept clean and tidy at all times.
* Be alert and proceed with caution at all times in the laboratory.  Notify the teacher immediately of any unsafe conditions you observe.
* Dispose of all chemical waste properly.  Never mix chemicals in sink drains.  Sinks are to be used only for water. Check with your teacher for disposal of chemicals and solutions.
* Labels and equipment instructions must be read carefully before use.  Set up and use the equipment as directed by your teacher.
* Keep hands away from face, eyes, mouth, and body while using chemicals or lab equipment.  Wash your hands with soap and water after performing all experiments.
* Experiments must be personally monitored at all times.  Do not wander around the room, distract other students, startle other students or interfere with the laboratory experiments of others.
* Know the locations and operating procedures of all safety equipment including: first aid kit(s), and fire extinguisher.  Know where the fire alarm and the exits are located.
* Know what to do if there is a fire drill during a laboratory period; containers must be closed, and any electrical equipment turned off
* Any time chemicals, heat, or glassware are used, students will wear safety goggles.

NO EXCEPTIONS TO THIS RULE!

* Contact lenses may be not be worn in the laboratory.
* Dress properly during a laboratory activity.  Long hair, dangling jewelry, and loose or baggy clothing are a hazard in the laboratory.  Long hair must be tied back, and dangling jewelry and baggy clothing must be secured.  Shoes must completely cover the foot.  No sandals allowed on lab days.
* A lab coat or smock should be worn during laboratory experiments.
* Observe and adhere to safety signs and instructions on chemical packages
* All chemicals in the laboratory are to be considered dangerous. Avoid handling chemicals with fingers. Always use a tweezer. When making an observation, keep at least 1 foot away from the specimen. Do not taste, or smell any chemicals.
* Check the label on all chemical bottles twice before removing any of the contents.  Take only as much chemical as you need.
* Never return unused chemicals to their original container.
* Never remove chemicals or other materials from the laboratory area.

**Chemical Storage and Labeling;**

* Distinguish between hazardous and non-hazardous chemicals.
* Use the physical state of the hazardous chemical (dry, liquid or gas) to determine general storage location guidelines:
* Planning Form chemical list to determine the hazards of your chemicals.

Proper labeling of hazardous chemical and waste is extremely important to reduce exposure, prevent accidents and extra disposal costs. Properly label all chemicals with full English name (no chemical structures or abbreviations), hazards, date and responsible party.  Proper chemical labeling is an important step in emergency planning and prevention. In the event of an incident such as fire or personal exposure, identifying the physical and health hazards of chemicals can be critical in minimizing adverse health effects and property damage. Improperly labeled and/or unidentified chemicals can ultimately end up as “unknown” chemical waste. Determining the contents of an “unknown” chemical is an involved and costly process and also presents unique concerns and hazards for chemical waste handlers and to the environment. Please take care to avoid creating “unknown” chemicals in your laboratory.

**EVALUATION**

1. State five safety measure when using chemicals
2. Mention three ways of Chemical Storage and Labeling

**GENEERAL EVALUATION**

1. State five safety measure when using chemicals
2. Mention three ways of Chemical Storage and Labeling
3. State two chemical safety measure
4. Mention two ways of Chemical Storage and Labeling**;**

**WEEKEND ASSIGNMENT**

1. Proper chemical ---------is an important step in emergency planning and prevention. A. labeling B. naming C. coding D. signaling
2. Properly label all chemicals with full ---------name A. English B. Greek C. Latin D. Spanish
3. Check the label on all chemical bottles ---------before removing any of the contents. A. twice B. thrice C. once D. always
4. A lab -------or smock should be worn during laboratory experiments. A. gown B. coat C. mantle D. sleeve
5. Never mix chemicals in------- drains. A. tin B. tray C. sink D. basin

**THEORY**

1. State two chemical safety measure
2. Mention two ways of Chemical Storage and Labeling**;**

**WEEK SIX**

**DRUG ABUSE**

DRUGS are Natural or synthetic substance which (when taken into a living body) affects its functioning or structure, and is used in the diagnosis, mitigation, treatment, or prevention of a disease or relief of discomfort.

**Meaning of drug Abuse**

habitual use of drugs not needed for therapeutic purposes, solely to alter one's mood, affect, or state of consciousness, or to affect a body function unnecessarily (as in laxative abuse). the use of a drug for a non therapeutic effect. Some of the most commonly abused drugs are alcohol; nicotine; marijuana; amphetamines; barbiturates; cocaine; methaqualone; opium alkaloids; synthetic opioids; benzodiazepines, COCAINE, HEROIN, MARIJUANA.

Habitual use of drugs not needed for therapeutic purposes (e.g., such as solely to alter one's mood, affect, or state of consciousness) or to affect a body function unnecessarily (e.g., laxative abuse); nonmedical use of drugs.

**EVALUATIO**N

1. What are drugs?
2. What is the meaning of drug abuse?

**Five Methods of Drug Abuse**

In order for drugs to affect the brain they must first be put into the body. There are five methods of drug use which allow drugs to enter the body: swallowing, smoking, snorting, through suppositories and injecting.

1. Swallowing

Ingesting or swallowing drugs is the most common method of drug use. The individual takes the drugs by mouth. The drugs pass to the stomach and then into the bloodstream. Of all the methods of drug abuse, taking drugs by mouth is considered to be one of the safest methods because it allows the body time to absorb the drug and the digestive system will self induce vomiting as a defense mechanism to ingesting something that does not agree with it.

2. Smoking

This method gets the drugs into the body’s system a bit faster than swallowing the drugs because the smoke goes into the lungs where it quickly moves into the bloodstream. The most common drugs that are smoked are marijuana, heroin, crack and opium. Individuals who smoke drugs are at risk for cancer of the mouth, throat and lung; heart disease and cardiac arrest, stroke, emphysema and bronchitis, pneumonia and other pulmonary disorders and hypertension.

3. Snorting

Some individuals snort drugs such as ecstasy, cocaine, heroin and amphetamines. Drugs enter into the bloodstream through the nasal mucus membranes and through the stomach. Individuals snorting drugs will experience the drug sensation within about 15 minutes after snorting their drugs. There are a number of complications from snorting drugs including the deterioration of the lining of the nasal cavity and the septum. Sharing straws and other items to snort the drugs can lead to hepatitis C and HIV.

4. Suppositories

Drugs entered into the body through suppositories will be delivered into the bloodstream through the rectum’s mucus membrane. While this is not a common method of drug abuse, drugs that have been taken using this method are cocaine, speed and ecstasy. The mucus membranes in the rectum are sensitive. Certain drugs may have a high level of acidity and can cause the lining to be permanently damaged. There is also a risk of perforating the lower colon which can be fatal.

5. Injecting

Injecting drugs is the fastest method for experiencing the high from drug use because it puts the drug directly into the bloodstream. Drugs can be injected into the soft tissue, into the muscle or directly into the vein. Individuals who inject drugs will experience the high within 3 to 5 seconds (immediately). This method of drug delivery goes directly to the brain, escaping the body’s natural defense mechanisms including the digestive system. The dangers that come with injecting drugs include infection at the site of injection. There is also the risk that sharing needles have including HIV and hepatitis. Some individuals may experience collapsing veins and arterial damage which can lead to gangrene, thrombosis and hemorrhaging.

**EVALUATION**

1. Explain smoking as a method of drug abuse
2. State five method of drug abuse

**Ways on How People Misuse Drugs**

* 1. Prescription drugs basically contain sedatives that are habit forming. Once, children depend too much on drug, for example, for pain relief there is a tendency for them to depend on taking drugs even for treating simple pain than sacrificing a bit.  Some children simply take pain killers even when it is not needed at all.
  2. Many teens have taken drugs without doctor’s prescription to reduce body weight. Since, taking drugs suppresses the appetite; most teens believe that drugs are the best remedy to obesity and overlapping love handles.
  3. Some teens simply buy drugs in the black market or obtain them from friends in order to feel extreme euphoria as for narcotics, opioids, and cracks.
  4. Some people take relaxants, sleeping pills, or painkillers in order to induce sleeps during night. Thus, every time they don’t feel at ease, depend on drugs to sleep early.
  5. Teens usually drink strong prescription medicines with cocaine or cannabis contents to relieve and recover strong emotions such as guilt, anger, and frustrations even though these drugs are actually prescribed for treating some diseases. This way of misusing drug is also brought by peer pressure.
  6. Some people inject drugs from time to time in order to grow muscles such as steroids despite its recommended limit of use for athletes during games only.
  7. Most kids simply take drugs orally because they usually see their parents taking the same drugs. Parents may not about the instance, but kids can be very observant on the palace where parents hide their drugs.
  8. Adults misuse drugs by taking them as an outlet to escape from severe problems at home caused by family truce and marital fight.
  9. Silent type teens take drugs to become energetic and self confident whenever there are night outs and parties. This gives them the confidence they want to talk to others, stand from bullies, and gain more friends despite that it not actually the main purpose of prescription drugs.
  10. Kids usually experiment on drugs. At times, they take it for the purpose of testing its effects. Some combine drugs with alcohol and other substances for more extreme effects. Others place drugs in some other people’s drinks for fun.

**Social Risk factor in drug abuse**

* Early Aggressive Behavior
* Lack of Parental Supervision
* Poverty Community
* peer pressure
* Familial risk factors include childhood maltreatment (including abuse and neglect), parental or familial substance abuse, marital status of parents, level of parental education, parent-child relationships, familial socioeconomic status, and child perception that parents approve of their substance use
* Physical and Sexual Abuse
* Emotional Abuse- emotional child abuse encompasses a situation whereby the child’s “intellectual or psychological functioning or development” is hindered. witnessing violence can increase an adolescent’s risk for developing a substance use disorder with alcohol, cigarettes, marijuana, or hard drugs by as much as two to three times. This is likely because witnessing violence creates great stress, especially in the case of a child witnessing domestic violence
* Neglect- child neglect includes any situation where a child’s caregiver does not provide adequate living necessities, including protection, clothing, health care, and/or food
* Bullying- it is defined as a series of interactions whereby a group or individual verbally or physically assaults a victim who is perceived to be weaker.
* Depression- The term depression encompasses feelings of sadness, pain, gloom, or anger. Clinical depression specifically refers to situations wherein a person’s depressive feelings interrupt their daily life. Depression has been shown to be linked to genetics and may also result from stressors such as parental divorce, parental substance abuse, depression of a family member, or feelings of inadequacy

**EVALUATION**

1. Mention five Ways on How People Misuse Drugs
2. List five Social Risk factor in drug abuse

**Deviant Peer Relationships**

The influence of peers on adolescent substance use often exists in the form of deviant peer relationships, wherein an adolescent associates with a group of people who use substances, or in the form of perceived popularity. Peer relationships are positively associated with adolescent substance use. It is possible that a shared inclination to use drugs and alcohol attracts deviant individuals to form peer groups or that, in order to gain social standing or join a group, individuals are motivated to use substances and thus form a deviant peer group.

Entry into deviant peer groups has also been shown to be significantly associated with negative parent-child relationships, which can cause adolescents to seek deviant connections in their social sphere. Conversely, parental involvement and respect for parents have been negatively associated with substance use. This is consistent with the aforementioned findings regarding positive parent-child relationships as a protective factor. This is an example of a way in which factors from familial and social spheres may work for or against each other in leading to adolescent substance use

**GENERAL EVALUATION**

1. What are drugs?
2. What is the meaning of drug abuse?
3. Mention five Ways on How People Misuse Drugs
4. List five Social Risk factor in drug abuse
5. Explain smoking as a method of drug abuse

**WEEKEND ASSIGNMENT**

1. ----------encompasses feelings of sadness, pain, gloom, or anger. A. Depression

B. Degradation C. Suppression D. Impression

1. -----------it is defined as a series of interactions whereby a group or individual verbally or physically assaults a victim who is perceived to be weaker. A. Bullying B. Scaring C. Assaulting D. Pouncing
2. Most kids simply take drugs orally because they usually see their --------taking the same drugs. A. parents B. mother C. father D. elders
3. ----------type teens take drugs to become energetic and self confident whenever there are night outs and parties. A. Silent B. Shouting C. Moderate D. Exposed
4. ----------drug is the fastest method for experiencing the high from drug use because it puts the drug directly into the bloodstream. A. Smoking B. Snorting C. Injecting

D. Swallowing

**THEORY**

1. State five Methods of Drug Abuse
2. What is the Meaning of drug Abuse?

**WEEK SIX**

**Crude oil and Petrochemicals I**

What is 'Crude Oil'

Crude oil is a naturally occurring, unrefined petroleum product composed of hydrocarbon deposits and other organic materials. Crude oil can be refined to produce usable products such as gasoline, diesel and various forms of petrochemicals. It is a nonrenewable resource, also known as a fossil fuel, which means that it can't be replaced naturally at the rate we consume it and is therefore a limited resource.

BREAKING DOWN 'Crude Oil'

Crude oil is typically obtained through oil drilling, where it is usually found alongside other resources, such as natural gas (which is lighter, and therefore sits above the crude oil) and saline water (which is denser, and sinks below). It is then refined and processed into a variety of forms, such as gasoline, kerosene, and asphalt, and sold to consumers.

Although it is often called "black gold," crude oil has ranging viscosity and can vary in color to various shades of black and yellow depending on its hydrocarbon composition. Distillation, the process by which oil is heated and separated in different components, is the first stage in refining.

**Petrochemicals**

Petrochemicals, also called petroleum distillates, are chemical products derived from petroleum. Some chemical compounds made from petroleum are also obtained from other fossil fuels, such as coal or natural gas, or renewable sources such as corn or sugar cane.

The two most common petrochemical classes are olefins (including ethylene and propylene) and aromatics (including benzene, toluene and xylene isomers). Oil refineries produce olefins and aromatics by fluid catalytic cracking of petroleum fractions. Chemical plants produce olefins by steam cracking of natural gas liquids like ethane and propane. Aromatics are produced by catalytic reforming of naphtha. Olefins and aromatics are the building-blocks for a wide range of materials such as solvents, detergents, and adhesives. Olefins are the basis for polymers and oligomers used in plastics, resins, fibers, elastomers, lubricants, and gels.

Primary petrochemicals are divided into three groups depending on their chemical structure:

**Olefins** includes ethylene, propylene, and butadiene. Ethylene and propylene are important sources of industrial chemicals and plastics products. Butadiene is used in making synthetic rubber.

**Aromatics** includes benzene, toluene, and xylenes. Benzene is a raw material for dyes and synthetic detergents, and benzene and toluene for isocyanates MDI and TDI used in making polyurethanes. Manufacturers use xylenes to produce plastics and synthetic fibers.

**Synthesis** gas is a mixture of carbon monoxide and hydrogen used to make ammonia and methanol. Ammonia is used to make the fertilizer urea and methanol is used as a solvent and chemical intermediate.

**Refining of Crude Oil**

1. Distillation

Modern distillation involves pumping oil through pipes in hot furnaces and separating light hydrocarbon molecules from heavy ones in downstream distillation towers – the tall, narrow columns that give refineries their distinctive skylines.

2. Cracking

Since the marketplace establishes product value, our competitive edge depends on how efficiently we can convert middle distillate, gas oil and residuum into the highest value products. Refinery convert middle distillate, gas oil and residuum into primarily gasoline, jet and diesel fuels by using a series of processing plants that literally “crack” large, heavy molecules into smaller, lighter ones. Heat and catalysts are used to convert the heavier oils to lighter products using three “cracking” methods: fluid catalytic cracking (FCC), hydrocracking (Isomax), and coking (or thermal-cracking).

3. Treating (Removing Impurities)

The products from the Crude Units and the feeds to other units contain some natural impurities, such as sulfur and nitrogen. Using a process called hydrotreating (a milder version of hydrocracking), these impurities are removed to reduce air pollution when our fuels are used.

4. Reforming

Octane rating is a key measurement of how well a gasoline performs in an automobile engine. Much of the gasoline that comes from the Crude Units or from the Cracking Units does not have enough octane to burn well in cars. The gasoline process streams in the refinery that have a fairly low octane rating are sent to a Reforming Unit where their octane levels are boosted. These reforming units employ precious-metal catalysts – platinum and rhenium – and thereby get the name “rheniformers.” In the **reforming process**, hydrocarbon molecules are “reformed” into high octane gasoline components. For example, methyl cyclohexane is reformed into toluene.

**Product testing**

**Blending**

A final and critical step is the blending of our products. Gasoline, for example, is blended from treated components made in several processing units. Blending and Shipping Area operators precisely combine these to ensure that the blend has the right octane level, vapor pressure rating and other important specifications. All products are blended in a similar fashion.

**Quality Control**

In the refinery’s modernly-equipped Laboratory, chemists and technicians conduct quality assurance tests on all finished products, including checking gasoline for proper octane rating. The reforming process actually removes hydrogen from low-octane gasoline. The hydrogen is used throughout the refinery in various cracking (hydrocracking) and treating (hydrotreating) units.

**Uses of Crude Oil and Petrochemicals**

1. Thus the crude oil is mostly used to produce energy.
2. Small portion of crude oil is converted into petrochemical feedstock used in production of plastics, rubber, fertilizers, cosmetics and the like.
3. Most of the crude oil is used to obtain motor gasoline, diesel, heating oil, jet fuel, and liquefied petroleum gases.
4. Gasoline (Used to fuel cars)
5. Heating Oil (Used to heat buildings)
6. Residual Fuel Oil (powering factories, fueling large ships, and making electricity)
7. Petrochemicals are used to produce a wide variety of materials, such as plastics, explosives, fertilizers, and synthetic fibers.
8. Food-additives are another major kinds of petrochemical which are known to act as preservatives and increase the tenure of freshness of canned food, so that the freshness of food can be enjoyed anywhere at any point of time.
9. Sneakers (synthetic shoes) have also got petroleum products as their content.
10. The non-stick pads made to plaster wounds are also a petrochemical product.
11. Plastic bottles are made from petrochemicals too.
12. Synthetic; this is a man-made petrochemical which often serves as the raw material for wrinkle-free garments. These fibers can be further finely woven tapestry, carpets, curtains, and many other things. Petrochemical is also used as fertilizers. Fertilizers like pesticides are used to protect crops from any sort of damage and increase crop production.

**Importance of Crude Oil and Petrochemicals**

1. The economic importance of crude oil is that it is used to produce gasoline and other fuels used around the world.
2. Gasoline is made from crude oil. Lubricating oil is also used to keep our automobile engines from getting too hot and to ensure that all moving parts of the machinery are kept in good working order.
3. Increased Job Creation; Most importantly, the petrochemical industry has worked increase job opportunities across the country.
4. Petrochemicals are used to create most of the everyday items we use. From vehicles to a variety of electronics, almost all of the things we use today are powered by or made of petrochemicals.

**WEEKEND ASSIGNMENT**

1. The reforming process actually removes --------from low-octane gasoline.

A. hydrogen B. oxygen C. fluorine D. nitrogen

1. In the refinery’s modernly-equipped Laboratory, chemists and technicians conduct quality assurance tests on all finished products, including checking gasoline for proper --------rating. A. octane B. nonane C. decane D. methane
2. The reforming unit employ precious-metal catalysts – platinum and rhenium – and thereby get the name-------A. rheniformers B. reformer C. catalizer D. none of the above
3. --------Oil Used to heat buildings. A. Heating B. Lubricating C. Gasoline D. Residual oil
4. ---------fiber is a man-made petrochemical which often serves as the raw material for wrinkle-free garments. A. Synthetic B. Polymeric C. Isomeric D. None of the above

**THEORY**

1. Mention four importance of crude oil and petrochemicals.
2. State the steps in refining crude oil.

**WEEK SEVEN AND EIGHT**

**ENVIRONMENTAL HAZARD 1 (Erosion and Flooding)**

**Introduction**

Environmental hazard are the damages that occur when the natural resources such as land, forest etc., are denatured, that is, when they are affected by some external factors such as soil erosion, flooding, bush burning, deforestation, desertification, dpletion of ozone layer etc, they loose their natural properties.

**Soil erosion**

Soil erosion is the removal of soil by water, wind and other agents. There are two major factors which contribute to holding the particles of soil firmly together. They are:

1. The clay content of the soil: soil varies from place to place but all soils have certain properties in common.
2. Another important factor is the roots of `the vegetation covering the soil.

**Human activities that causes soil erosion**

1. Careless cultivation
2. Bush burning
3. Industrialization
4. Expansion of urban areas
5. Highway construction

**Methods of controlling soil erosion**

1. Planting cover crops

Cover crops are so known because they cover the soil evenly by not allowing rain to fall directly on the soil.

1. Strip cropping :This involves alternating row crops like maize or cassava with cover crops such as beans, cowpea or grass.
2. Mulching

This is a control measure employed by using dry grass to cover ridges ans mounds on the farm.

1. Planting of trees and grass

Trees and grass serve as wind breaks; the roots of the plants also help to hold soil particles together against the action of rain and wind.

1. Making ridges along slopes

Soil erosion can also be controlles by making ridges and planting crops along the slope of a hill

1. Terracing : On steep slopes, the most effective method is to construct terraces (a series of ridges or steps that resemble a staircase) to reduce the speed of water and thus prevent erosion.

**EVALUATION**

1. Define environmental hazard
2. State three methods of controlling erosion.

**Flooding**

Flooding occurs when excess amount of water covers a particular area that is not usually covered with water.

**Causes of flood**

1. Amount of rain: Excessive rainfall may cause flooding because water runs off the land in quantities that cannot be carried in stream channels
2. Establishment of settlements along river channels: Some areas are of rivers and other bodies of water such as the flood plains are sometimes filled with sand and used for development purposes.
3. Strong tidal waves

Tidal waves can be low or high depending on the time and season of the year.

1. Dumping of refuse which may block culverts or water channels.
2. Presence of steep slopes in an area.
3. Inadequate or poor urban planning.
4. Breakdown of dams and embankments.

**Drainage pattern**

1. Surface drainage
2. Sub-surface drainage

**Prevention of flooding**

1. Public enlightenment on effects of flooding
2. Construction of dams and levees to act as flood reservoirs.
3. Construction of wider gutters or culverts.
4. Disallowing indiscriminate dumping of refuse.
5. Regular clearance of drainage channels to prevents blockage
6. Prevention of the erection of buildings in swampy areas or along water paths.

**EVALUATION**

1. Define flooding.
2. State three causes of flooding.

**GENERAL EVALUATION**

1. Define environmental hazard
2. State three methods of controlling erosion.
3. Define flooding.
4. State three causes of flooding.

**WEEKEND ASSIGNMENT**

1. Soil ---------is the removal of soil by water, wind and other agents. A. erosion B. land C. water D. evacuation
2. Excessive rainfall may cause ---------because water runs off the land in quantities that cannot be carried in stream channels A. erosion B. flooding C. evacuation D. tanning
3. Construction of dams and levees to act as flood-----------. A. tank B. culvertt C. reservoirs D. nonagons
4. ----------occurs when excess amount of water covers a particular area that is not usually covered with water. A. Camping B. Storming C. Drilling D. Flooding
5. Excessive ----------may cause flooding because water runs off the land in quantities that cannot be carried in stream channels A. rainfall B. drainage C. flooding D. control

**THEORY**

1. Define flooding
2. State three ways by which flooding can be controlled

**WEEK NINE**

**FAMILY TRAITS**

**Introduction**

In living things that carries out sexual reproduction, the offspring inherit their characteristics from their parents. These characteristics are passed on in the gametes at fertilisation, thereby making the offspring resemble their parents.

**Types of organism**

This is when the young one of a particular organism resembles the same type of organism. For example, the human being resembles a human being not a dog, not a cow, nor a goat. Also cat reproduces cat not lion, etc.

**Qualities of a particular parent**

This is when the offspring resembles a particular parent more than the other in the area of complexion, height, intelligence, etc. For example, a child may be as tall as the father and as light in complexion as the mother, who may not be so tall.

Family traits are the characteristics that are transmitted from the parents to the young ones. The transmission of such traits or the process of passing the traits to the young ones is called heredity. Heredity is an important factor that affects the growth and development of a child.

**Examples of family traits**

1. Complexion
2. Sizes and colours of eyes
3. Height (whether tall, short or average)
4. Shape of nose, mouth, face, head etc
5. Intelligence
6. Blood type group
7. Body structure and posture
8. Size of ear
9. Sickle cell traits
10. Gait (ways of walking)
11. Albinism
12. Temperament, that is, how quickly they react to situations and or people.

**EVALUATION**

1. Differentiate between types of organism and qualities of a particular parent
2. Mention five examples of family traits

**Meaning of dominant and recessive traits**

**Genes**: these are molecules produced by the chromosomes which are structures in the nucleus of a cell.

**Dominant traits**: these are traits or characteristics which manifest or show in an individual thereby causing the individual to resemble one parent or the rather than the other.

**Recessive traits**: these are traits or characteristics which do not manifest when the dominant traits are present.

T T t t

Tt Tt Tt Tt

F1 geneartion

T t T t

TT Tt Tt Tt

F2 generation

**Importance of family traits**

1. It helps to explain why a child is brilliant or dull.
2. It can be used to detect crime.
3. It also helps in tracing family genealogy or a particular pedigree.
4. It can reduce the occurrence of hereditary diseases such as eye defects, sickle cell

anaemia, etc.

The traits you have inherited from your parents, that you can see are the traits that are dominant. The trait that you have inherited from them but which are not expressed are the recessive ones.

Some trait may be recessive by long period of time but after some time they manifest. An albino parent may have non albino child if the spouse is not albino. Albinism is complete partial lack of pigmentation in the skin hair and eyes. This is why they react to light, and their skin is easily affected by insect bites.

Gregor Mendel also observed there can be situations whereby it will be difficult to identify which gene is dominant or recessive. This is called partial dominance. An example is when a child is fair in complexion and the two parents are also fair in complexion.

However, it must be noted that environmental factors have effects on whatever trait that is inherited by an individual. Examples of environmental factors are food, whether, diseases, facilities etc. A child may inherit the trait tallness of his parent but if the does not have good nutrient, he/she falls sick often, he or she may grow well in terms of height a;so a child that inherit the trait of intelligence but does not attend school with good facilities to study may not be bright. Such differences are not passed to the next generation and this brings about variation.

Let us look at some of the works of Gregor Mendel to explain better the meaning of dominant and recessive traits. If a pure tall breed pea was on crossed breed with a pure short breed pea. All the peas in the filia generation would be tall trait was dominant.

Stage 1: Tall(TT) and short (tt) were crossedbreed.

**Note: in F1** generation, all the offspring were tall (i.e Tt, Tt, Tt, and Tt). It means that for the trait (height) tallness was dominant while shortness was recessive.

**Stage 2:** if Tt and Tt were crossbreed.

**In** F2 generation, three offspring were tall (i.e TT, Tt and Tt) and one offspring was short (i.e tt)

This means in the F2 generation, three offspring out of the four were carrying the traits of tallness hence the tallness was expressed and therefore was the dominant trait, while one offspring which is shortness was the recessive trait.

**EVALUATION**

1. Define the following a. genes b. recessive traits c. dominant trait
2. State three importance of family traits

**GENERAL EVALUATION**

1. Differentiate between types of organism and qualities of a particular parent
2. Mention five examples of family traits
3. Define the following a. genes b. recessive traits c. dominant trait
4. State three importance of family traits

**WEEKEND ASSIGNMENT**

1. ----------- helps to explain why a child is brilliant or dull. A. family traits

B. propagation C. animal trait D. expected trait.

1. ------------is complete partial lack of pigmentation in the skin hair and eyes

A. Deafness B. Dumbness C. Swollining D. Albinism

1. The traits you have inherited from your parents, that you can see are the traits that are ---------A. dominant B. recessive C. offspring D. none
2. The trait that you have inherited from parents but which are not expressed are the --------ones A. recessive B. dominant C. genetic D. none
3. --------- are molecules produced by the chromosomes which are structures in the nucleus of a cell. A. Genes B. Dominant C. Recessive D. none

**THEORY**

1. Mention five examples of family traits
2. Define the following a. genes b. recessive traits c. dominant trait