PAPER 1

Bones – Identification and Functions

- **Identification:** Learn about the different bones in the human body. Examples: skull, femur, ribs.
- **Functions:** Bones support the body, protect organs, help with movement, store minerals, and produce blood cells.

Structure of the Skeleton – Shape/Purpose

- **Shape:** The skeleton is made up of bones and cartilage. It's structured to support the body's weight and allow movement.
- **Purpose:** Provides a framework for the body, protects organs, and works with muscles for movement.

Muscles – Identification

- **Muscle types:** Skeletal (attached to bones), smooth (found in organs), and cardiac (found in the heart).
- Focus on identifying major skeletal muscles like biceps, quadriceps, and hamstrings.

Structure and Components of a Synovial Joint (+ Tendons)

- **Synovial Joint:** A joint that allows free movement (like the knee or elbow).
- **Components:** Synovial fluid (lubricates the joint), articular cartilage (reduces friction), ligaments (hold bones together), and tendons (connect muscles to bones).

Types of Synovial Joints – 2 Main

1. **Ball and Socket (e.g., shoulder, hip):** Allows circular movement.
2. **Hinge (e.g., knee, elbow):** Allows back-and-forth movement.

Movement at Joints

- **Flexion:** Decreasing the angle at a joint.
- **Extension:** Increasing the angle at a joint.
- **Abduction:** Moving away from the body.
- **Adduction:** Moving toward the body.

Muscle Movements – Agonist/Antagonist, Isometric/Isotonic

- **Agonist:** The muscle that contracts to create movement (e.g., bicep during a bicep curl).

- **Antagonist:** The muscle that relaxes as the agonist contracts (e.g., tricep during a bicep curl).
- **Isometric:** Muscle contraction without movement.
- **Isotonic:** Muscle contraction with movement.

Pathway of Air

1. Air enters through the **mouth/nose**.
2. Moves through the **trachea**.
3. Into the **bronchi**, then the **bronchioles**.
4. Reaches the **alveoli** (where gas exchange happens).

Gaseous Exchange

- Happens in the **alveoli** of the lungs. Oxygen moves into the blood, and carbon dioxide moves out of the blood into the alveoli to be exhaled.

Blood Vessels – Structure

- **Arteries:** Thick walls, carry blood away from the heart.
- **Veins:** Thinner walls, carry blood to the heart.
- **Capillaries:** Very thin walls, allow gas and nutrient exchange.
- Vasoconstriction/Vasodilation

Structure of the Heart

- **Chambers:** 4 chambers—2 atria and 2 ventricles.
- **Valves:** Ensure blood flows in one direction.
- **Arteries:** Carry blood away from the heart (e.g., aorta).

Cardiac Cycle

- Describes how the heart pumps blood: the atria contract, then the ventricles contract, sending blood to the lungs and the rest of the body.

CO, SV, HR

- **CO (Cardiac Output):** Amount of blood the heart pumps per minute.
- **SV (Stroke Volume):** Amount of blood pumped with each beat.
- **HR (Heart Rate):** Number of heartbeats per minute.

Mechanics of Breathing – Inhale/Exhale, Changes Through Exercise

- **Inhale:** Diaphragm contracts, lungs expand, air enters.
- **Exhale:** Diaphragm relaxes, lungs contract, air is pushed out.
- During exercise, breathing rate and volume increase to supply muscles with more oxygen.

Spirometer Trace – Draw & Interpret

- Learn to read a spirometer, which measures lung volume and airflow.
- Understand the different stages like tidal volume, inspiratory reserve, etc.

Aerobic vs Anaerobic Exercise

- **Aerobic Exercise:** Requires oxygen, e.g., running. **Equation:** Glucose + Oxygen → Energy + Carbon Dioxide + Water.
- **Anaerobic Exercise:** No oxygen required, e.g., sprinting. **Equation:** Glucose → Energy + Lactic Acid.
- **AO3 - Justification for different sports:** Aerobic is good for endurance, anaerobic for short bursts of power.

EPOC (Excess Post-Exercise Oxygen Consumption)

- Refers to the extra oxygen needed after exercise to help the body recover.

Recovery from Exercise (AO3 - evaluate these methods)

- **Cool Down:** Prevents muscle stiffness.
- **Diet Manipulation:** Replenishes energy stores.
- **Ice Bath:** Reduces muscle soreness.
- **Massage:** Helps with relaxation and circulation.
- Evaluate each method's effectiveness for different athletes.

Immediate, Short and Long-Term Effects of Exercise

- **Immediate:** Increased heart rate, breathing rate, and muscle temperature.
- **Short-Term:** Muscle fatigue, soreness.
- **Long-Term:** Improved cardiovascular health, muscle strength, and endurance.

1st, 2nd, and 3rd Class Levers – Identify in the Body

- **1st Class:** Fulcrum in the middle (e.g., neck).
- **2nd Class:** Load in the middle (e.g., calf raises).
- **3rd Class:** Effort in the middle (e.g., bicep curl).

Mechanical Advantage

- The ability to lift a larger load with less effort, typically seen in 2nd-class levers.

Analysis of Basic Movements in Sports

- **Sally Took** Somersault, RUNNING (Sagittal Plane, Transverse Axis)
- **Fred's Stick** Star jump, GK save in football (Frontal Plane, Sagittal Axis)
- **To London** Ice skating spin (Transverse Plane, Longitudinal Axis)

Health and Fitness – Definitions & Relationships

- **Health:** Being free from illness.
- **Fitness:** The ability to perform physical activities.
- These are related because good health often leads to better fitness, and fitness helps maintain health.

Components of Fitness

- **Strength, Flexibility, Endurance, Speed, Power, Agility, Balance, Coordination.**
- **AO3 - Justify** why each component is/ is not important for different sports (e.g., flexibility for gymnastics, strength for football).

Fitness Testing

- **Tests:** Include the beep test, sit-up test, vertical jump.
- **AO3 Evaluate the relevance of the tests:** Testing helps assess fitness, but can be influenced by factors like motivation.

Principles of Training – SPORT/FITT

- **S:** Specificity
- **P:** Progression
- **O:** Overload
- **R:** Reversibility
- **T:** Tedium
- **FITT:** Frequency, Intensity, Time, Type.

Types/Methods of Training A03 - evaluate/discuss appropriateness of method for different sports/ identified athlete

- **Continuous Training:** Steady, moderate intensity (good for endurance).
- **Interval Training:** Alternating between high and low intensity (good for power).
- **Weight Training:** Builds strength.

Training Intensity & Zones

- **Training Zones:** Aerobic (60-80% max HR), Anaerobic (80-90% max HR).
- **1 Rep Max:** Used to determine strength training loads.

Considerations to Prevent Injury

- Warm up, cool down, use correct technique, and avoid overtraining.

Altitude Training

- **Benefits:** Increases red blood cell count.
- **Limitations:** May cause dehydration or altitude sickness.

Warm-Up and Cool-Down

- **Warm-up:** Increases blood flow and prepares muscles for exercise.
- **Cool-down:** Helps the body return to resting state and prevents injury.

Use of Data – Quantitative and Qualitative

- **Quantitative:** Numerical data (e.g., time, distance).
- **Qualitative:** Descriptive data (e.g., how the athlete feels).
- Learn how to draw and interpret data.

PAPER 2

Linking Physical Activity to Wellbeing

- Physical Wellbeing: Exercise improves cardiovascular health, muscle strength, and flexibility.
- Mental Wellbeing: Physical activity can reduce stress, improve mood, and boost mental health by releasing endorphins.
- Social Wellbeing: Participating in physical activity can build social connections, teamwork, and improve confidence.

Benefits of Physical Activity on Fitness

- Improves cardiovascular fitness, muscular strength, flexibility, and muscular endurance.
- Enhances overall wellbeing, helping with stress management and weight control.

Consequences of a Sedentary Lifestyle

- Can lead to weight gain, poor cardiovascular health, and muscle weakness.
- Increases the risk of diabetes, hypertension, and mental health problems like anxiety and depression.

Obesity – Effects on Performance

- Physical Health: Limits endurance, flexibility, and strength. Can increase the risk of joint problems.
- Mental Health: May reduce confidence and motivation.
- Social Health: Can lead to social isolation and lower self-esteem.

Somatotypes – **AO3 Justify a Suitable Body Type for a Sport**

- Ectomorph: Slim, lean body, suited for endurance sports (e.g., long-distance running).
- Mesomorph: Muscular, athletic build, ideal for strength-based sports (e.g., sprinting, bodybuilding).
- Endomorph: Larger, rounder build, suited for sports that require strength and power (e.g., rugby, shot put).

Energy – Measurement and Requirements for Males/Females

- Energy Requirements: Men typically need more calories due to higher muscle mass.

- Measuring Energy: Energy intake is measured in kilocalories (kcal). The daily requirement varies based on age, gender, and activity level.

Balanced Diet – Reasons for

- Helps maintain energy levels, muscle growth, and immune function.
- Reduces the risk of chronic diseases like diabetes, heart disease, and obesity.

Proportion of Diet for Fat, Protein, and Carbs

- Carbs: 45-65% of daily intake (for energy).
- Protein: 10-35% of daily intake (for muscle repair and growth).
- Fat: 20-35% of daily intake (for energy and hormone production).
- Vitamins & Minerals: Important for immunity, energy production, and bone health.

Dehydration – Definition and Effects - **AO3 - Evaluate the consequences**

- Dehydration: When the body loses more water than it takes in.
- Effects on Performance: Dehydration can lead to reduced stamina, concentration, and heat-related illnesses. Affects physical and mental performance.

Classification of Skill – **AO3 Justify Classification for different Sports**

- Open Skill: Unpredictable, changing environment (e.g., football).
- Closed Skill: Predictable, stable environment (e.g., gymnastics).
- Complex Skill: Requires decision-making and high focus (e.g., swimming starts).
- Simple Skill: Basic, requires little decision-making (e.g., running).

Goals – Performance/Outcome

- Performance Goals: Focus on improving technique (e.g., improving a swimming stroke).
- Outcome Goals: Focus on results (e.g., winning a race).
- Evaluation: Both types are important for different reasons, with performance goals leading to gradual improvement and outcome goals driving motivation.

Use of SMART Targets to Improve Performance

- Specific, Measurable, Achievable, Realistic, Time-bound.
- Example: “I will run 5 km in under 30 minutes in 6 weeks.”

Basic Information Processing Model

- Input: Information from the environment (e.g., seeing a ball coming toward you).
- Decision Making: Deciding how to react (e.g., deciding to jump or catch). LTM/STM
- Output: The action taken (e.g., jumping or catching).
- Feedback: Information about the performance (e.g., coach's comment).

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4 Types of Guidance

- Visual: Demonstrating the skill (good for beginners).
- Verbal: Explaining the skill (good for all levels).
- Manual: Physically guiding the performer (helpful for beginners).
- Mechanical: Using equipment to help (good for beginners in technical sports).

Feedback – Positive/Negative, Extrinsic/Intrinsic, Knowledge of Results/Knowledge of Performance

- Positive Feedback: Encourages improvement (e.g., “Great job!”).
- Negative Feedback: Corrects mistakes (e.g., “Try to bend your knees more”).
- Extrinsic Feedback: Comes from an external source (e.g., coach).
- Intrinsic Feedback: Comes from the performer (e.g., feeling of success or failure).

Mental Preparation – Arousal

- Arousal: The level of alertness or readiness to perform.
- Inverted U Theory: A moderate level of arousal leads to the best performance. Too little or too much arousal can negatively affect performance.

Controlling Arousal with Stress Management Techniques

- Techniques: Breathing exercises, visualization, progressive muscle relaxation.

Direct/Indirect Aggression

- Direct Aggression: Physical harm to another person (e.g., a tackle in football).
- Indirect Aggression: Harm to an object to gain an advantage (e.g., breaking a racket in tennis).

Introvert/Extrovert – Characteristics, Arousal Levels, Suitable Sports

- Introverts: Prefer less stimulating, individual sports (e.g., swimming).
- Extroverts: Thrive in social, team sports (e.g., football, basketball).

Motivation – Intrinsic/Extrinsic

- Intrinsic Motivation: Doing something for personal satisfaction (e.g., self-improvement in sport).
- Extrinsic Motivation: Doing something for external rewards (e.g., trophies, money).

Engagement Patterns in Physical Activity – Different Social Groups

- Social groups (e.g., age, gender, socio-economic status) influence participation in physical activities. Young people may engage in sports like football, while older people may prefer walking or swimming.
- **AO3 - Justify the links between engagement patterns and the different social groups**

Commercialisation – Define and the ‘Golden Triangle’

- Commercialisation: The process of making sports a business.
- Golden Triangle: The relationship between sport, media, and sponsors.

Sponsorship & Media – Definition & Types

- Sponsorship: A company supporting an athlete or event financially in exchange for promotion.
- Media: Broadcasting sports events, advertising, and promoting athletes.

Sponsorship & Media - **AO3 Justify Positive & Negative Impacts**

- Positive: Raises money for the sport, increases visibility.
- Negative: Can lead to the commercialization of sport, affecting its integrity.

Technology – **AO3 Justify Positive & Negative Impacts** on *performer/sport/official/ spectator/sponsor*

- Positive: Improves performance through data analysis, training apps, and equipment.
- Negative: Can lead to over-reliance on technology and reduce the human aspect of sport.

Conduct of Performers – Etiquette

- Following proper conduct and respect for others in a sport, such as fair play, respect for opponents, and following rules.

Spectator Behaviour – Positive/Negative Influences

- Positive: Spectators can motivate athletes.
- Negative: Disruptive behavior, such as booing, can affect the atmosphere and the performers.

Hooliganism – Reasons for It and Strategies to Combat

- Reasons: Frustration, aggression, and social issues.
- Strategies: More policing, crowd control, and improved fan behavior campaigns.
- **AO3 - Evaluate the effectiveness of the strategies**

Prohibited Substances (Drugs)

- Positive Effects: Increased performance (e.g., blood doping).
- Negative Effects: Health risks like organ damage and addiction.
- **AO3 - Evaluate the benefits/ side effects for different sports performers**

Blood Doping – How It Occurs and Effects

- How It Happens: Increasing the number of red blood cells in the body, usually through transfusions or drugs.
- Positive Effects: Increased oxygen capacity.
- Negative Effects: Increased risk of heart problems, strokes, and infections.