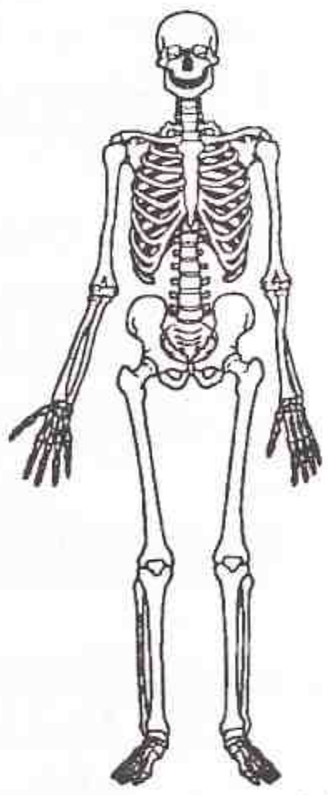
ANATOMY

Read the General Rules in the manuals and on www.soinc.org as they apply to every event.

1. **DESCRIPTION:** This event encompasses the anatomy (**structure and function)** of the **skeletal** and circulatory systems and the effects of **aging** and diseases on **them.**

   A TEAM OF UP TO: 2 **APPROXIMATE TIME**: 50 Minutes
2. **EVENT PARAMETERS**: Each team member may bring a non-programmable calculator. No resources are allowed.
3. **THE COMPETITION**: Students should know the basic anatomy of the skeletal and circulatory systems and how aging and specific diseases affect them. Process skills expected may include data collection, making observations, inferences, predictions, calculations, analyses and conclusions. The test may include **various formats** (e.g., timed stations, written test, slides, etc.) for the following topics:
   a. **SKELETAL SYSTEM - All competition levels should know**:
      i. Bones of the axial and appendicular skeleton (excluding the skull bones); label the basic surface anatomy of a bone as shown on a diagram and/or normal X-ray.
      ii. Names, structure and function of types of joints and human ranges of motion *allowed by each type (e.g., ball and socket).*
      iii. Structures of bones in cross-section.
      iv. Cellular composition, structure and function of bones, bone marrow and cartilage.
      v. How to distinguish between types of vertebrae (e.g., cervical, thoracic and lumbar).
      vi. The diseases on each level from the cell to the whole person as listed (also know radiological features of each disease): osteoarthritis, osteoporosis, fractures, disc herniation and scoliosis.
      vii. The effects of exercise on the skeletal system and the diseases mentioned.



      National Level Only:
      viii. Additional Disorders to know: spinal stenosis, rheumatoid arthritis, gout, and juvenile rheumatoid arthritis.
      ix. Treatments and/or prevention for all conditions listed above (drugs, surgery, etc.).
      x. Label the bones of the skull.
      xi. Salter-Harris fracture classification system.

   b. **CIRCULATORY SYSTEM - All levels should know**:
      i. The heart-chambers, valves and coronary arteries.
      ii. Blood vessels-**the cellular and gross anatomy** of arteries, arterioles, veins, venules, capillaries, and name the major vessels of the body.
      iii. Blood components: red blood cells, platelets and white blood cells.
      iv. Lymphatics: Define/describe the components of lymphatic fluid and the structure and function of the lymphatic system.
      v. **How to label** flow of blood through the heart and body.
      vi. Measurement of the pulse rate and blood pressure.
      vii. Relevant calculations including mean arterial pressure, stroke volume and cardiac output.
      viii. The diseases **on each level from the cell to the whole person as listed:** arteriosclerosis, **atherosclerosis,** high blood pressure, high cholesterol, **stroke, myocardial infarction, cardiogenic shock, lymphoma.**

      National Level Only:
      ix. The Heart – interpreting ECG (EKG) readings (label and understand the normal wave form) and identify EKG tracings of: ventricular tachycardia, myocardial infarction, and atrial fibrillation.
      x. Function of **albumin**.
      xi. Understand the Starling forces that determine how lymphatic fluid is made.
      xii. Additional diseases: **atrial fibrillation, congestive heart failure, Kawasaki's disease.**
      xiii. Treatment and prevention of **all** described diseases **(including use of an artificial pacemaker and automated external defibrillator).**
      xiv. **Understand the role of aspirin in myocardial infarction and stroke.**
4. **SCORING**: High score wins. Selected questions/quality of free-response answers will be used to break ties.

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