

## The Human Machine

<b>Grades:</b>	2, 3
<b>Team Size:</b>	1-3 competitors
<b>Duration:</b>	30 minutes
<b>Supervisors:</b>	Anna Nicklas, Emily Crowley, Rebecca Falzon

### Summary Description

Teams will be tested on their knowledge and understanding of basic human anatomy and physiology. There will be two components to this event. The first will involve a standard test with questions pertaining to the overall concepts of human anatomy and physiology and eleven organ systems. The second component will be a rotating station practical assessment focusing on the specific organ system(s) identified for that year. **2020 - Muscular and Skeletal Systems**

### Changes from Previous Year

This is a new event.

### Concepts Covered (more detail provided in the study guides)

The goal of “The Human Machine” is for students to develop an understanding of the human body and the individual parts and systems that work together to make it function. All concepts listed below are required for both 2<sup>nd</sup> and 3<sup>rd</sup> grade unless indicated as 3<sup>rd</sup> grade only in the study guide.

### General Anatomy and Physiology

- Concept of Anatomy vs. Physiology
- Body Basics
  - Fluids
  - Cells
  - Tissues (connective, epithelial, muscle, nervous)
  - Organs
  - Organ Systems
- Human Organ Systems - function and major components of each as outlined in the study guide
  - Skeletal
  - Muscular
  - Nervous
  - Digestive
  - Endocrine
  - Circulatory (Cardiovascular)
  - Respiratory
  - Immune/Lymphatic
  - Reproductive
  - Integumentary
  - Excretory (Urinary)

- System cooperation and homeostasis

### **2020 System Focus - Muscular and Skeletal**

- Functions of the Skeletal System
- Major Structures of Skeletal System
- Types of Bone (long, short, flat, irregular, sesamoid)
  - Major bones (list provided in study guide)
- Functions of Muscular System
- Types of Muscles (skeletal, cardiac, smooth)
  - General location of each type
  - Major muscles (list provided in study guide)
  - involvement in other systems
- Muscular and Skeletal system cooperation (how they work together) \* 3<sup>rd</sup> grade only
- Common trauma to muscles and bones (fractures, sprains, strains, and cramps)
- Proper care of Musculoskeletal system

### **Rules/Competition Format**

Each team of 1 to 3 participants will have 30 minutes for the competition. The students will be given a brief introduction and provided with specific instructions needed for the event. The competition will consist of 2 parts.

- Part I
  - General human anatomy and physiology
  - 10 minutes
  - Multiple choice, fill in the blank, true false and/or matching questions
- Part II
  - Practical portion on musculoskeletal system
  - 10 to 15 minutes
  - 3 to 5 stations
  - Teams will be given 2-3 minutes (depending on the number and complexity of the stations) and will be instructed when to move to the next station
  - Multiple choice, fill in the blank, true false and/or matching questions
  - All questions at stations will be printed on cards at each station as well as on the answer sheet provided in the test.

For the remaining time, teams may continue working on either portion of the test if needed and may return to the practical stations to complete their tests. All teams will be given exactly the same amount of time to complete the test. Teammates may quietly discuss the questions, but each team must come up with only one answer to each question. Correct spelling is not required as long as words are phonetically recognizable.

### **Practical Section for 2020: Muscular and Skeletal Systems**

- Stations will consist of pictures, models, x rays or other physical props.
- Only the SCIENTIFIC NAMES of the bones, broken or not broken, or muscles will be

accepted as correct. (For example, “upper arm bone” is incorrect – the correct answer is “**humerus**”, or “thigh muscles” is incorrect -- the correct answer is “**quadricep, hamstring**”). A list of the specific bones and muscles that the teams should know and their acceptable scientific names can be found in the study guide.

- Bones or muscles from the right or the left side of the body may be used, but identification of the side is not required unless specifically requested in the test question. Students should be prepared to identify muscles and bones from pictures, models, x rays, a small 3ft. skeleton, and/or a full-sized skeleton. Individual bones, muscles (or models of such) would be presented in groups of connected bones and/or muscles in order to identify based on anatomical context. (i.e. - teams would not be given an individual bone or muscle and asked to identify it by itself)
- Some books capitalize all the bone and muscle names, and some do not. For this test, capitalization is not required.
- Students may be shown an x-ray that contains an obvious fracture and asked to identify the bone that is fractured as well as the type of fracture. Students will only be required to identify radiographs of bone fractures.

### Scoring

- The point value of each question in both sections will be clearly marked.
- There will not be a score deduction for spelling errors (as long as phonetically recognizable).
- Completion time will not be considered in scoring.

### Tie Break Criteria

There will be several marked tiebreaker questions, one in the general anatomy section and one in the practical portion. The tie breaker question will only be graded in case of a tie.

### Materials Distributed by WESO

2020: DK Smithsonian book: *Human Body!* (ISBN: 978-1-4654-6239-8)

Previously distributed for No Bones About It: One (1) Axis Scientific Miniature Human Skeleton

*It is the responsibility of the school’s head coach to pick up materials distributed by WESO and transfer all new and past materials to the event coaches. If your school did not receive any of the materials (newly distributed or past materials), please contact your head coach so arrangements can be made for them to obtain the materials.*

### Materials to be brought to competition

- None.
- Supervisors will provide pencils and erasers for the test. No calculators are needed.
- A reference sheet will not be allowed.