

ACTIVITY TITLE: **THE GEOMETRY OF WRISTS AND ANKLES**

PURPOSE: The activity will enhance learners math skills related to geometric principles and medical nomenclature through use of the skeletal system applications.

INTEGRATION:
Primary Mathematics (Geometry, Intermediate Algebra)
Secondary *Health Science*

ACTIVITY: Learners examine the bones of the human wrist and ankle and relate their observations to geometrical principles.

- Learners listen to a presentation about the name, volume, mass and shape of selected bone(s) in the body.
- Learners, in teams, study human anatomical models, charts and textbooks to identify the names of the eight carpal (wrist) bones and determine the meaning of each of these names.

Answers:

hamate (hook-shaped)
pisiform (pea-shaped)
capitatum (rounded like a head)
trapezoid (four-sided)
trapezium (four-sided)
triquetrum (has three articular surfaces)
lunate (shaped like a crescent moon)
scaphoid (boat-shaped)

- Teams consult human anatomical models, charts and textbooks to identify the names of the seven tarsal (ankle) bones and determine the meaning of each of these names.

Answers:

first (medial) cuneiform (wedge-shaped)
second (intermediate) cuneiform (wedge-shaped)
third (lateral) cuneiform (wedge-shaped)
cuboids (resembling a cube)
calcaneus (a specific shape, refers to heel)
talus (a specific shape, refers to ankle in general)
navicular (boat-shaped)

- Teams determine the mass and volume of each bone using a formula for a known shape or by estimation methods.
- Teams compare their results with other teams and discuss the formulas used and methods of estimation used.

INSTRUCTOR
ROLE:

- Arrange for a Rehabilitation Specialist, Physical Therapist or Orthopedic Physician to discuss the anatomical structures involved in the activity and present information on the concepts of volume, mass and shape of specific bones of the skeletal system.
- Provide references needed for the exercise.
- Facilitate the activity.

EDUCATION
PARTNER ROLE:

- A health science instructor can supply skeletal models and assist with facilitation.

HEALTHCARE
PARTNER ROLE:

- A Rehabilitation Specialist, Physical Therapist or Orthopedic Physician can discuss the anatomical structures involved in the activity and present information on the concepts of volume, mass and shape of specific bones of the skeletal system.

RECOMMENDED
RESOURCES:

- Anatomical models and charts
- Textbooks

SUGGESTED
ASSESSMENT:

- Learners, in teams, determine the geometrical meaning of the carpal and tarsal bones.
- Learners, in teams, determine volume, mass and shape of selected bones and compare their findings.
- Refer to Appendix II:
 - A. [Collaborative Learning](#)

CAREER
CLUSTER
ALIGNMENT:

- National Education Standard(s): [Geometry](#)
- National Healthcare (Foundation) Skill Standard(s): [Academic Foundation \(1\), Systems \(3\), Teamwork \(8\)](#)
- State Standard(s):
- Career Development Standard(s): [Educational and Occupational Exploration](#)