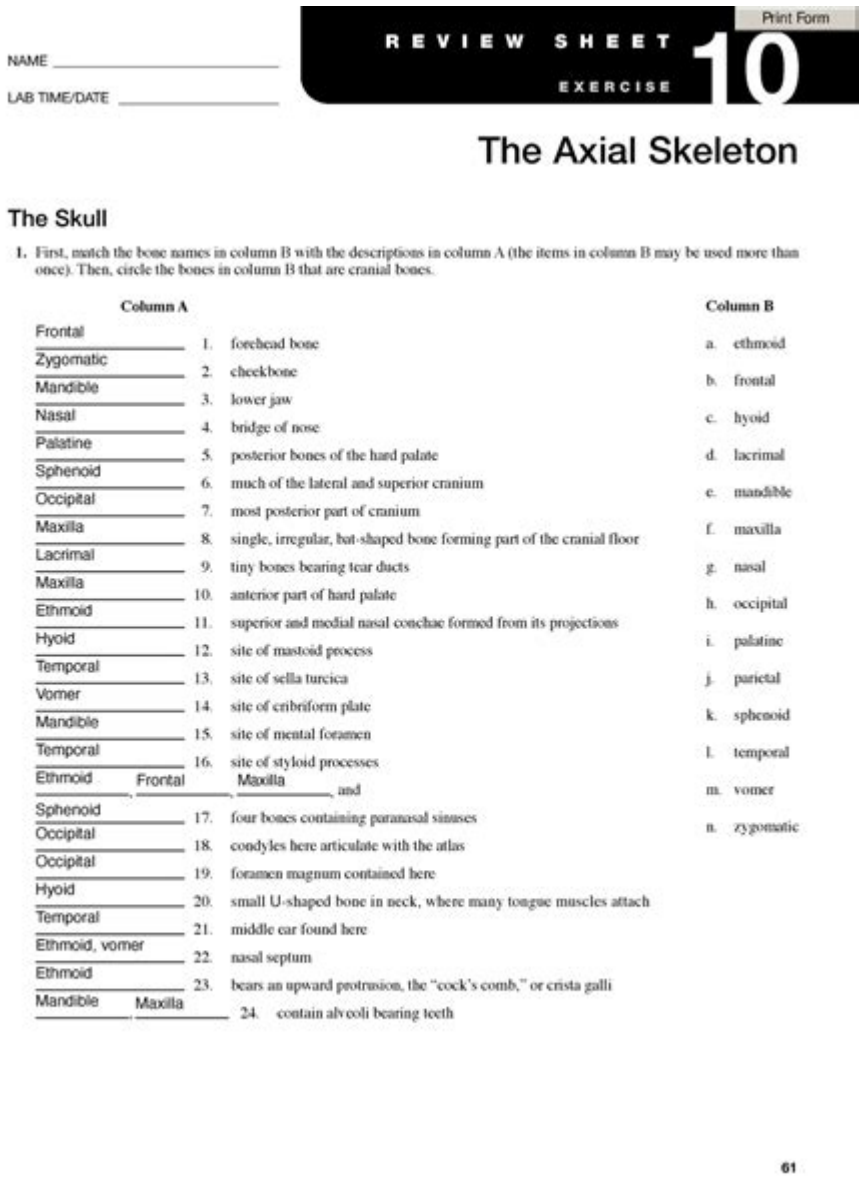
Exercise 10 The Axial Skeleton



NAME _____

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REVIEW SHEET EXERCISE 10

Print Form

The Axial Skeleton

The Skull

1. First, match the bone names in column B with the descriptions in column A (the items in column B may be used more than once). Then, circle the bones in column B that are cranial bones.

Column A			Column B
Frontal	1.	forehead bone	a. ethmoid
Zygomatic	2.	cheekbone	b. frontal
Mandible	3.	lower jaw	c. hyoid
Nasal	4.	bridge of nose	d. lacrimal
Palatine	5.	posterior bones of the hard palate	e. mandible
Sphenoid	6.	much of the lateral and superior cranium	f. maxilla
Occipital	7.	most posterior part of cranium	g. nasal
Maxilla	8.	single, irregular, bat-shaped bone forming part of the cranial floor	h. occipital
Lacrimal	9.	tiny bones bearing tear ducts	i. palatine
Maxilla	10.	anterior part of hard palate	j. parietal
Ethmoid	11.	superior and medial nasal conchae formed from its projections	k. sphenoid
Hyoid	12.	site of mastoid process	l. temporal
Temporal	13.	site of sella turcica	m. vomer
Vomer	14.	site of cribriform plate	n. zygomatic
Mandible	15.	site of mental foramen	
Temporal	16.	site of styloid processes	
Ethmoid, Frontal, Maxilla, and			
Sphenoid	17.	four bones containing paranasal sinuses	
Occipital	18.	condyles here articulate with the atlas	
Occipital	19.	foramen magnum contained here	
Hyoid	20.	small U-shaped bone in neck, where many tongue muscles attach	
Temporal	21.	middle ear found here	
Ethmoid, vomer	22.	nasal septum	
Ethmoid	23.	bears an upward protrusion, the "cock's comb," or crista galli	
Mandible, Maxilla	24.	contain alveoli bearing teeth	

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Exercise 10 the axial skeleton is an essential topic in the study of human anatomy, particularly for students and professionals in the fields of medicine, physical therapy, and fitness. The axial skeleton serves as the central framework of the body, supporting and protecting vital organs while allowing for movement and flexibility. Understanding its structure, components, and functions is crucial for anyone involved in health and physical education. This article will delve into the axial skeleton's anatomy, its importance, and how exercise can enhance its strength and functionality.

Understanding the Axial Skeleton

The axial skeleton is one of the two major divisions of the human skeleton, the other being the appendicular skeleton. It comprises 80 bones that are primarily located along the body's midline, providing a stable core that supports the head, neck, and trunk.

Components of the Axial Skeleton

The axial skeleton can be divided into three main components:

1. Skull: The skull consists of 22 bones that protect the brain and form the structure of the face. It is further divided into:
- Cranial Bones: These include the frontal, parietal, temporal, occipital, sphenoid, and ethmoid bones. Together, they encase and protect the brain.
- Facial Bones: These include the nasal bones, maxillae, zygomatic bones, mandible, and several others, contributing to facial structure and function.

2. Vertebral Column: The vertebral column, or spine, is made up of 33 vertebrae divided into five regions:
- Cervical: 7 vertebrae (C1-C7) located in the neck.
- Thoracic: 12 vertebrae (T1-T12) connected to the ribs.
- Lumbar: 5 vertebrae (L1-L5) in the lower back.
- Sacral: 5 fused vertebrae forming the sacrum.
- Coccygeal: 4 fused vertebrae forming the coccyx (tailbone).

3. Thoracic Cage: The thoracic cage consists of the ribs and sternum, providing protection for the heart and lungs while facilitating respiration. It includes:
- Ribs: 12 pairs of ribs, with the first seven pairs referred to as "true ribs" and the next five as "false ribs."

- Sternum: Also known as the breastbone, it consists of three parts: the manubrium, body, and xiphoid process.

Functions of the Axial Skeleton

The axial skeleton serves several critical functions, including:

- Support: It forms the central axis of the body, providing structure and support for the head, neck, and trunk.
- Protection: The axial skeleton encases and protects vital organs, such as the brain, heart, and lungs.
- Movement: The joints between the vertebrae allow for flexibility and movement while maintaining stability.
- Blood Cell Production: The bone marrow within certain bones of the axial skeleton is responsible for producing blood cells.
- Mineral Storage: Bones act as reservoirs for minerals, particularly calcium and phosphorus, which are essential for various bodily functions.

Exercise and the Axial Skeleton

Regular exercise plays a vital role in maintaining the health and functionality of the axial skeleton. It helps to strengthen bones, improve posture, and enhance the overall mobility of the spine and surrounding structures.

Benefits of Exercise for the Axial Skeleton

Engaging in physical activity offers numerous benefits for the axial skeleton, including:

1. Bone Density Improvement: Weight-bearing exercises stimulate bone formation and increase bone density, reducing the risk of osteoporosis.

2. Enhanced Flexibility: Stretching and flexibility exercises help maintain the range of motion in the spine and surrounding joints.

3. Postural Correction: Strengthening exercises for the core muscles can improve posture, reducing strain on the axial skeleton.

4. Reduced Pain and Discomfort: Regular movement helps alleviate stiffness and pain in the back and neck.

5. Injury Prevention: Stronger muscles and improved flexibility can help prevent injuries to the spine and surrounding structures.

Types of Exercises Beneficial for the Axial Skeleton

Incorporating a variety of exercises into your routine can promote the health of the axial skeleton. Here are some effective types:

1. Strength Training: Lifting weights or performing resistance exercises strengthens the muscles that support the spine. Key exercises include:
- Deadlifts
- Squats
- Lunges
- Bent-over rows

2. Core Stability Exercises: A strong core supports the spine. Effective core exercises include:
- Planks
- Bridges

- Russian twists
- Bird-dogs

3. Flexibility and Stretching: Regular stretching can improve flexibility and reduce tension in the muscles. Important stretches include:
- Cat-Cow Stretch
- Child’s Pose
- Seated Forward Bend
- Spinal Twists

4. Aerobic Activities: Activities like walking, jogging, swimming, or cycling contribute to overall fitness and help maintain a healthy weight, reducing pressure on the spine.

5. Yoga and Pilates: Both practices focus on core strength, flexibility, and body awareness, making them excellent for promoting axial skeleton health.

Precautions and Considerations

While exercise is highly beneficial, it is essential to approach it with caution, especially for individuals with existing conditions related to the axial skeleton. Here are some considerations:

- Consult a Professional: Before starting any new exercise regimen, especially if you have a history of back pain or injury, consult with a healthcare professional or a qualified fitness trainer.

- Listen to Your Body: Pay attention to any signs of discomfort or pain during exercise. Modify or stop activities that cause discomfort.

- Focus on Form: Proper technique is crucial to prevent injuries. Ensure you are using the correct form, particularly during strength training exercises.

- Progress Gradually: Increase the intensity and duration of your workouts gradually to avoid overexertion.

Conclusion

In summary, exercise is vital for maintaining the health and functionality of the axial skeleton. Understanding its structure and functions enables individuals to appreciate the importance of physical activity in supporting the spine and associated structures. By incorporating a range of exercises targeted at strengthening the core, improving flexibility, and enhancing overall fitness, one can promote the health of the axial skeleton effectively. Remember to consult a professional, listen to your body, and prioritize proper form to ensure a safe and effective exercise routine. Through consistent effort, individuals can build a resilient axial skeleton that supports a healthy and active lifestyle.

Frequently Asked Questions

What is the axial skeleton and what bones does it consist of?

The axial skeleton is the central framework of the body that includes the skull, vertebral column, ribs, and sternum. It supports the head, neck, and trunk, and protects the brain, spinal cord, and thoracic organs.

How many bones are in the human axial skeleton?

The human axial skeleton typically consists of 80 bones, including 22 in the skull, 26 in the vertebral column, and 24 in the rib cage.

What is the primary function of the vertebral column in the axial

skeleton?

The primary function of the vertebral column is to protect the spinal cord, provide structural support and stability for the body, and allow for flexibility and movement.

What role do the ribs play in the axial skeleton?

The ribs protect vital organs in the thoracic cavity, such as the heart and lungs, and also aid in the mechanics of breathing by expanding and contracting the chest cavity.

How does the axial skeleton contribute to overall body posture and balance?

The axial skeleton serves as the main support structure for the body, maintaining posture and balance through its alignment and interaction with the appendicular skeleton, which includes the limbs and pelvis.

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