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# THE ART OF BONES: SCULPTING WITH CLAY

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## Introduction

The laboratory activity "The Art of Bones: Sculpting with Clay" is designed to enhance Diploma in Pharmacy students' understanding of the skeletal system through an interactive and hands-on approach. By utilizing clay as a medium, students construct

three-dimensional bone models, allowing them to explore skeletal structures beyond textbook learning. This method not only reinforces anatomical concepts but also cultivates artistic and spatial skills, making the learning process both educational and engaging.

Through this activity, students gain a deeper comprehension of bone anatomy and physiology by visualizing and manipulating bone structures. Sculpting with clay requires precision, attention to detail, and strong observational skills, as students work meticulously to replicate the shapes, sizes, and textures of bones. This fosters critical thinking and spatial awareness, helping students develop a well-rounded understanding of the skeletal system beyond theoretical knowledge. Additionally, this approach encourages creativity and craftsmanship, instilling a sense of pride as students bring their models to life. By integrating science with art, the activity promotes a more immersive and enriching educational experience.



Figure 1: Tarsus, Metatarsus, Phalanges  
(Source: Author's own collection)

**Students gain a deeper comprehension of bone anatomy and physiology by visualizing and manipulating bone structures.**



## Advantages and Usefulness of Clay Bone Models in Anatomy Education

Using clay to create bone models offers several advantages, particularly in anatomy education. One of the primary benefits is tactile learning, as students actively shape and construct bone structures, engaging multiple senses and reinforcing their understanding of anatomy. This kinesthetic approach enhances knowledge retention, making it an effective learning tool. Furthermore, clay is an affordable and widely accessible material, making it a cost-effective option for educational institutions with limited resources.

Another key advantage is customizability. Clay's malleability allows students to create personalized bone models, enabling them to analyze specific skeletal components, fractures, or anomalies in greater detail. The ability to mold and modify the structures encourages fault correction and exploration, as students can refine their models to better understand intricate anatomical details. Additionally, visualization plays a crucial role in learning, and 3D clay models help students grasp the location, orientation, and dimensions of bones more effectively than two-dimensional images.

Clay models are also durable and reusable, allowing educational institutions to repurpose them for multiple

learning sessions. Beyond individual learning, clay modeling fosters collaboration among students, as they work together to construct models, discuss anatomical structures, and exchange knowledge. The material is also non-toxic and safe, ensuring a healthy and risk-free learning environment for students.

Overall, incorporating clay modeling in anatomy education bridges the gap between theoretical knowledge and practical application. This hands-on approach enhances student engagement, improves comprehension, and fosters a deeper appreciation for the complexity of the human skeletal system.



Figure 2: Carpus, Metacarpus, Phalanges  
(Source: Author's own collection)

## Novelty: A Collaborative Learning Approach

The use of clay for bone modeling introduces a non-technological innovation in anatomy education by

promoting collaborative learning. Instead of creating individual models, students work in small groups to construct comprehensive skeletal structures, fostering teamwork and cooperative learning. This approach provides several benefits, including:

- **Peer Learning:** Group collaboration allows students to learn from each other's techniques and approaches, facilitating knowledge sharing and deeper comprehension of anatomical structures.
- **Division of Labor:** Assigning specific tasks—such as molding different bone structures or labeling sections—allows students to focus on particular areas while contributing to the overall project.
- **Problem-Solving Skills:** Encountering challenges during model construction encourages students to brainstorm solutions collectively, strengthening their analytical and critical thinking abilities.
- **Increased Engagement:** The interactive nature of group work enhances motivation and makes anatomy lab sessions more dynamic and enjoyable.
- **Teamwork and Communication:** Collaborating on a shared model promotes effective communication, encouraging students to exchange ideas, techniques, and knowledge in a supportive learning environment.

To implement this approach, educators can organize students into groups, provide clear guidelines, and facilitate discussions throughout the modeling process. Encouraging teamwork and shared learning experiences optimizes the educational benefits of this innovative method.

### Commercialization Potential of Clay Anatomy Kits

The development and marketing of Clay Anatomy Kits present a promising commercialization opportunity based on the success of clay modeling in anatomy laboratories. These kits would provide students with all necessary materials, instructions, and templates to construct their 3D skeletal models. Additionally, they can be tailored to align with diploma program curricula in healthcare and anatomy, making them valuable educational tools.

A key aspect of commercializing Clay Anatomy Kits is ensuring comprehensive kit components. Each kit will include various colors of clay to differentiate bone structures, along with templates or molds for accurate shaping. Additional elements such as labeling materials, reference guides, and instructional resources will further enhance the learning experience.

To maximize their educational impact, the kits will be developed in collaboration with anatomy educators to ensure curriculum alignment with



Figure 3: Mandible  
(Source: Author's own collection)

diploma programs. They can be customized to focus on specific topics or anatomical regions, offering students structured and targeted learning experiences. The inclusion of step-by-step guides, visual aids, and concise explanations will make the kits accessible to a wide range of learners.

Another potential feature is customization and expansion packs, allowing students to personalize their kits and extend their anatomical model collections. Additional molds or templates may be sold separately, enabling learners to explore more intricate skeletal structures over time.

The kits also hold significant potential for institutional sales,

as they can be marketed to educational institutions, anatomy laboratories, and healthcare training centers. Institutions may purchase them in bulk to provide standardized learning resources for students. Additionally, the online distribution of these kits would make them accessible to a broader audience, including students, educators, and institutions worldwide. Selling them through educational supply websites or directly from manufacturers would further expand their reach. To increase credibility and visibility, partnerships with reputable educational and anatomical organizations could be pursued. Collaborating with anatomy textbook publishers,

educational software developers, or medical equipment companies would enhance marketability and facilitate wider promotion and distribution of the kits.

By integrating these strategies, Clay Anatomy Kits could serve as an innovative and practical educational resource, bridging the gap between hands-on learning and structured anatomical education. This commercialization potential highlights the growing demand for interactive learning tools in health and medical education, offering a valuable business opportunity while advancing student learning outcomes.

Conclusion

The "Art of Bones: Sculpting with Clay" laboratory activity offers an innovative, hands-on approach to anatomy education, enhancing students' understanding of the skeletal system while fostering critical thinking, creativity, and collaboration. The use of clay as a modeling



Figure 4: Vertebrae in horizontal plane.  
(Source: Author's own collection)

medium provides cost-effective, customizable, and durable learning tools, making anatomy education more engaging and accessible. Additionally, the collaborative aspect of this activity strengthens peer interaction, problem-solving, and teamwork, enriching the overall learning experience.

Beyond its academic benefits, the commercialization potential of Clay Anatomy Kits with academic curricula,

institutions and educators can provide students with a structured and immersive approach to anatomical learning. Ultimately, this initiative bridges the gap between science and art, promoting a deeper appreciation for the complexity of the human skeletal system while making anatomy education more interactive, effective, and impactful.