

# Moving Hand

Do you know how many bones are in your hand? Create a moveable model to discover the many parts of your hand. Use your model to explore how your bones, tendons, and muscles all work together to move your hand and fingers.

## TEKS:

7.3B: The student is expected to use models to represent aspects of the natural world, such as human body systems and plant and animal cells.

7.12B: The student is expected to identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems.

## Materials:

- Beads
- Chopsticks
- Craft foam
- Double sided tape or glue
- Paper straws
- Pen
- Scissors
- Twine or yarn

## How To:

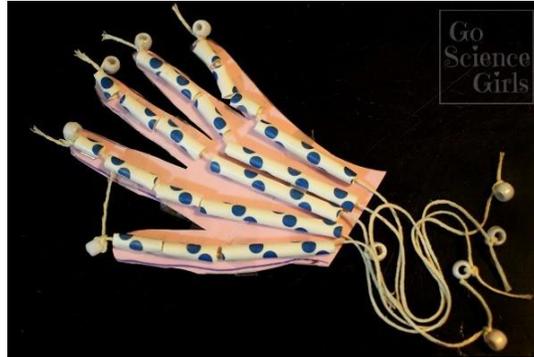
1. Trace your hand on a piece of craft foam. Then cut your hand outline out of the foam.
2. The bones in your fingers are called phalanges. Feel your fingers to figure out where the phalanges are—can you feel three bones in each finger and two bones in your thumb? Cut the paper straws into small pieces to represent the bones in your fingers. Using double sided tape or glue, stick the pieces of straw (3 for your finger bones; 2 for your thumb bones) onto the fingers of your foam hand. Leave a large gap between the pieces of straw so that your foam fingers can bend later!

**31 Days of STEM FUN!**

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3. Then, cut 5 longer pieces of straw to represent the bones in your palm (called metacarpals). The metacarpals attach to the phalanges. Stick the metacarpals to your foam hand with double sided tape or glue. Don't forget to leave a large gap between each piece of straw so that your foam fingers can move!
4. Cut five pieces of twine, each about a foot long. Tie a bead to one end of each piece of twine. Thread a piece of twine through the straws of each finger (be sure to thread it through the metacarpals on your palm, too!).
5. Once your twine has been threaded through the straws, tie another bead to the opposite end of each piece of twine to prevent it from falling out of the straws. Each piece of twine should now have a bead at both ends.
6. Tape a chopstick to the palm of the foam hand so that you can hold it. Then pull gently on the twine to make your fingers move!



<https://gosciencegirls.com/articulated-hand-movable-fingers-joints-tendons/>

### STEM Explanation:

The hand has many bones. The three bones in each finger and two bones in each thumb are called phalanges. The phalanges connect to the metacarpals which are the five bones in the palm of your hand. Altogether, you have 19 bones in each hand! Your fingers and thumbs are moved by tendons which are moved by muscles. In most other bones in your body, tendons attach muscles to bone, and then the muscles move the bone. However, your fingers are special because there are no muscles in your fingers. Instead, the muscles that control your fingers are located in your palm and forearm. The muscles move the tendons in your fingers, and it's the tendons that make your fingers move. The tendons slide through a tendon sheath, which is connected to your finger bones. Look at both sides of your actual hand as you open and close your fingers, and you will see the tendons that are moving your fingers! In this experiment, we used straws to represent the tendon sheaths and twine to represent the tendons.

### Career Connection:

*Orthopedic surgeons* treat a number of conditions that affect the bones, joints, muscles, ligaments, tendons, and nerves. These doctors work closely with other health care providers and often serve as consultants to other physicians. Before going to medical school, future orthopedic surgeons must have a deep understanding of all sciences including chemistry, biology, and physics.

### Resource:

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