

## The Development of Muscles for Writing

Children use their body to aid their early mark making and then writing by using a sequence of muscle movements. Which muscles they use depend on which stage of development they are at

### Key Skills for Writing

Proprioception	Vestibular System	Low-load Control	Bilateral Coordination	Hand /Eye Coordination
Brain using all sorts of information from different parts of the body to help it to move effectively within its given space. Muscle tension, pressure, the sensory feedback that monitors the body position and control and posture e.g. Am I sitting or standing, how should I hold my body how much pressure do I need to apply to hold this object.	An essential part of movement is being able to maintain balance whilst still and in motion. Large physical movements of the arms and upper body shift the centre of balance. Helps you know where you are in space.	Shoulders ability to support your arm and hand as you write. Your shoulder and upper arm support you in achieving this when you come to write something. Your hand and shoulder should glide together like a swan.	Co-ordination of both sides of the body at the same time in a controlled way. This can mean using both sides to do the same thing, like pushing open a door or jumping into a puddle. Using alternating movements when both sides of the body are doing the same thing but not at the same time. Walking is a good example of this where our arms and legs will be making a similar movement to each other but in sequence. The most complex level of bilateral coordination is where the body has to do two completely different movements on each side but at the same time using such as when cutting with scissors while holding and controlling the paper with the other hand.	One of the fundamental skills which hold the key to so many of the things that children need to be able to do, not only to become successful mark makers but to have success in virtually every aspect of their life. This is the ability to control hand movement guided by vision. We use this skill to enable us to draw, paint, thread cut, pour, eat, build and write to name but a few.
<b>What will help?</b>				
Lots of practice and moving around different types of area, different surfaces, Swinging on monkey bars. Resistant movements such as -arriving wheelbarrows, pulling elastic.	Not sitting down on a chair while they are at a table so they can use their whole body. Outdoor areas such as woods and environments that are unpredictable. Obstacle courses.	Shoulder rotating and playdough lifting exercise. Climbing on fixed equipment, hanging from monkey bars. Stretching and reaching. Digging and sweeping, wheeling wheelbarrows.	Opening and closing tupperware lids, scooping objects or rice with a cup with one hand and holding the bucket while pouring them inside, playing clapping games, sewing cards, putting bricks and things together making sandwiches, stirring ingredients in a bowl while holding on the bowl with the other hand, threading beads.	Threading beads, bubbles, small construction, Hammer beads, woodwork, pegs, weaving, Ipad, throwing things in buckets, hoops and baskets, catching balls, beanbags, scarves

**Pivot : Where children pivot from will let you know where they are up to in their physical mark making development.**  
**There is an intrinsic link between pivot and grip.**

**Stage 1 - Shoulder pivot**

**Grip: Palm or Palmer or Palmer Supinate**



During the early stage of development babies when children are learning to support their head, reach, grasp and walk. They are using groups of muscles in their pelvis back, shoulders, arms and neck. It is these upper body muscle groups that children use in the very emergent stages of mark making. Children will have already developed a grasp that allows them to hold something tight without dropping it. This grasp is formed by wrapping the fingers around the object and making a fist with the object half in the middle. This is known as a palmer grasp.

At this stage in their development the muscles of their upper body that are the most well developed are the neck, chest and back. It is these muscles that have the most strength, so it is these muscles that are used to help the hand to make those first emergent marks. Often at this stage the child will have a fairly stiff wrists and a straight elbow.

The type of mark that a child at this stage of development can make will be at the maximum range so they are likely to be long and straight to large and circular as their range of movement is restricted to the strongest muscle group they have available.

**What will help:**  
 Sweeping with brooms, using large brushes on the fence.  
 Write Dance  
 Parachute  
 Bread dough

**Stage 2 - Elbow Pivot**  
**Grip: Palmer**



At this stage in development the shoulder comes more of a support and the elbows start to do most of the work. There are usually two noticeable stages in the elbows pivot. The first is the emergent stage where the elbow bends allowing for a greater range of movement but the shoulder is still the main 'power' in moving the arm backwards and forwards. This look like a swing motion where the arm tends to move in straight lines across the body or from front to movement. Often when the elbow pivot is developing the wrist stays quite stiff and the grip is still palmer back.

When a child becomes more proficient in the elbows pivot then they begin to use the muscles in their upper and lower arm to swing their arm in and out from their body in a circular action. This is an advanced elbow pivot (think stirring in a pot or creating a figure eight) This significant increases the range of movement. Often when the elbow pivot is developing the wrist stays quite stiff and the grip is still palmer supinate.

**What will help:**  
 Lots of rollers, long handled brushes and scrubbing brushes to paint with  
 Hammers  
 Woodwork  
 Playdough – different textures and resistance

**Stage 3 – Wrist Pivot**

**Usually palm but probably about to change**



Usually palm but probably about to change.

As the pivot moves to the wrist the elbow often tucks into the side of the body and the shoulder movement becomes minimal. Lowload controls is definitely in play. By the time that children reach the wrists pivot stage in their lower arms, upper arms and shoulders are all now well developed and their overall movement and balance tends to be far more fluid that it was when they started.

The wrist pivot is the one that children tend to stick with for the least amount of time before their pivot shifts again. Often with a write pivot comes a change in a child's grip from palmer supinate to digital pronate (palm turned down).

When a child adopts a digital pronate grip they bend write to nearly 45 degrees, grip their mark making finger to manipulate the end of it.

This is a clear sign that their stage of fine motor manipulation implement with their fingers and use their first finger to manipulate the end of it. This is a clear sign that their stage of fine motor manipulation is moving forward. Encourage rotation and small movements

**What will help:** Finger rhymes, rolling playdough. Etc House painting brushes to develop the up and down action. Screwdrivers, bolts  
 Lots of thick pens, chalks mark making implements

**Static Tripod Grasp**

Tools are held similar to a darts player, holding with all five fingers. Movement mainly comes from the wrist, but as hand strength improves there will be some finger movement. Continuous adjustment of other hand to maintain balance and co-ordination.



**Dynamic Tripod Posture Grasp**

Tools held using thumb, first and middle finger. Thumb and little fingers flexed to form stable arch. Wrist slightly extended. Fingers beginning to move independently as the child develops their finger muscles. Much more fluid movement.



**Pincer Grasp or Grip**

This enables a child to pick up small items using the thumb and index finger. The most basic form of this skill is when children use all fingers to "rake" items into the palm of their hand. During the next phase of their development.

**Palm Arches**

There are several arches within the palm of your hand that enable the hand to grasp a range of different objects of various sizes and shapes. These arches direct the skilled movement of your fingers and control the power of your grasp. Your palm arches are directly related to your ability to manipulate a mark making implement (like a pencil or paint brush). If your palm arches are not well developed then they cannot provide enough support to your fingers to allow them to turn to manipulate the mark-making tool. This is why children will grasp their mark making implement in their palm.

**In-Hand Manipulation**

This skill refers to the ability move and position objects within one hand without the assistance of the other hand. Children (and some adults) often find this really hard. Children need lots of practice with items such as elastic bands and pencils being able to move them in between their fingers. Also round objects like conkers or marbles which they have to rotate in the palm of one hand.

**Thumb Opposition**

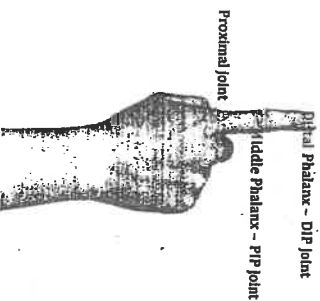
This refers to the ability to turn and rotate the thumb so that it can touch each fingertip of the same hand. Start with the palm spread and then get the children to use their thumb to touch each of the fingertips in turn. After each individual touch always return to a spread palm. When they become proficient at doing each hand individually then get them to do both hands at the same time. To extend this challenge further ask the children to do both hands together, but start with the index finger on one hand and the little finger on the other.

**Finger Isolation -**

To do this you need to be able to isolate each finger one at a time. At the early stages of dexterity development children will move all of their fingers together in a grasping motion. As they develop, they learn to move the fingers individually. This ability is very important in the development of fine motor skills. It is the mechanism that will allow children to hold and manipulate a pencil or a paintbrush as well as the laces, push buttons and a host of other every day essential skills.

**Knuckle, PIP and DIP Joint:**

The development of these help you be able to manipulate well to support tripod grip.



**What will help?**

Pick up small things - sequins, thread Tweezers, pegs

Squeezing playdough, clay, anything with resistance, slit a tennis ball and open it with the palm and put a bead in it. Unscrewing small plastic pots, squeezing water bottles to make patterns on the floor, squeezing wet sponges. Picking things up with tongs.

Picking up objects and setting them in the palm of the hand - Pick up a worm!

Using finger rhymes  
Buttons, zippers buckles

Finger painting, poppers, looms, buttons, zips, tils, phones, wool, string, pipe cleaners

To develop this joint you need to work with things that are small and fiddly and malleable. Working with clay or mallow playdough or stretchy elastic any materials that give you resistance. Marshmallow dough, loom bands

