

# FAQ (& EVIDENCE-BASED ANSWERS!)

Use the FAQ Sheet to answer commonly asked questions related to pencil grasp and functional grasp in the classroom. Be aware that these questions and answers will not reflect every child's individual and specific needs and problem areas. Just as each child presents with a different grasp pattern, so may the underlying reasons and influences. These FAQ are intended to provide an understanding of the problem areas related to common concerns related to pencil grasp and grasp patterns.

## QUESTION: What does typical grasp development look like?

**ANSWER:** Age ranges are listed as these are general ages of development:

### Early Grasp Patterns:

- ✓ **6-10 months-** Pincer grasp- Thumb opposed to pointer finger, ring and pinkie fingers are not tucked into the palm
- ✓ **10 months-2 years-** Fisted grasp- The pencil is held in the palm with the thumb up. The wrist is in neutral or in a supinated position
- ✓ **12-15 months-** Palmer Pronate Grasp- Gross grasp with the thumb wrapped around the pencil. The pencil is held with a fisted hand with the thumb down toward the paper.
- ✓ **2-3 years-** Digital Pronate Grasp- Hand positioned in a pronated position with pencil in the palm of the hand

### Functional Grasp Patterns:

- ✓ **3-4 years-** Static Tripod Grasp- Pencil is held with the thumb, pointer finger, and middle finger. The pencil is moved by the whole arm, forearm, or wrist. This is a functional grasp pattern.
- ✓ **4-6 years-** Dynamic tripod grasp- The pencil is held by the thumb, pointer finger, and middle finger. The pencil is moved by distal mobility of these joints. This is a functional grasp pattern. True dynamic tripod grasp may not be truly established until age 14.

Once a child progresses to a Static Tripod Grasp or a Dynamic Tripod Grasp, they have reached a functional grasp pattern. The child may skip this step or move to an inefficient grasp pattern. Other "outside of the box" grasps may be considered functional.

Functional Grasp presents as legible and efficient. "Functional" can mean different things to different individuals.

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## QUESTION: What does an inefficient grasp pattern look like?

**ANSWER:** An inefficient grasp is one which does not include the typical components of a dynamic or static tripod grasp. The child may or may not use efficient components of pencil grasp (in-hand manipulation, distal mobility, separation of the sides of the hand, open thumb web space, and an extended/neutral wrist). There are several components that indicate an inefficient grasp, and a child does not need to present with all of these components to utilize an inefficient pencil grasp. Some examples of an inefficient pencil grasp include:

- A pencil grasp that uses the power fingers as opposed to the action fingers
- Joints that are hyper-extended or bent back beyond normal range of motion
- Joints that demonstrate extreme pressure on the pencil and appear lightened in skin tone due to so much pressure being used through the joints
- A pencil that is moved by proximal movements, such as shoulder, forearm, or wrist mobility
- A pencil grasp that does not utilize separation of the sides of the hand (the Power Fingers are not bent into the palm to support the Action Fingers)
- Poor distal mobility of the fingers when moving the pencil
- A “hooked wrist” or wrist flexion when writing
- Inefficient writing speed, or a pencil speed that is laborious
- Excessive pencil pressure leading to dark pencil writing that is difficult to read
- Fatigue or pain when writing

## QUESTION: What does an efficient grasp pattern look like?

**ANSWER:** Research completed by May (2010), states that efficient pencil grasp patterns include the tripod, quadrupod, and adapted tripod grasp patterns. Schwellnus et al., (2012) further established that there are four mature grasp patterns that allow for functional handwriting skills. These grasp patterns include the dynamic tripod grasp, the lateral tripod grasp, the dynamic quadruped grasp, and the lateral quadruped grasp.

## QUESTION: How do I know if a pencil grasp should be changed?

**ANSWER:** Non-traditional pencil grasps can be functional IF handwriting is legible, efficient, and completed without fatigue or pain. Some non-traditional pencil grasps include:

- Thumb Wrap Grasp-The thumb is wrapped over the pencil or over the pointer finger, closing the thumb web space.
- Fisted Grasp- The development of pencil grasp has not progressed in development.
- Inter-digital Braced Grasp- The pencil is braced for stability between fingers.

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- Four finger Grasp- The thumb and all four fingers are positioned on the pencil shaft.
- Many other grasps can be functional. The biggest point to remember is if the written work is legible and completed without pain or fatigue, then the grasp is functional!

### QUESTION: Can a pencil grasp be changed?

**ANSWER:** The best way to name a pencil grasp in a screening or evaluation is to describe the way the child holds a pencil. Therapists can vary in what each considers a “interdigital grasp”. One child may hold the pencil between the pointer and middle fingers in an inter-digital grasp. Another may hold the pencil between the middle finger and ring finger in an inter-digital grasp. Some children shift the position of the pencil as their hand fatigues. The best way to understand a child’s positioning on a pencil is to describe the position of the pencil. As per research completed by Feder & Majnemer (2007), skills needed for handwriting plateau between 7 and 8 years of age and begin to become automatic.

### QUESTION: What about “bad pencil grasps”? Can grasp be changed in older kids?

**ANSWER:** A pencil grasp can be changed if an early grasp pattern occurs within the typical age range, or adjusted age range. Developmental progression can be facilitated through fine motor activities. The typical age range for addressing an inefficient grasp occurs up through age 7. After this age, a change in grasp requires intrinsic motivation.

An older child who presents with pain, fatigue, or biomechanical stress on the joints as a result of a hyper-extended joint can try pencil grippers. Grasp is capable of change with motivation on the part of the individual.

See question below for more information on changing pencil grasp patterns.

### QUESTION: What is the Impact of Posture on Pencil Grasp Patterns?

**ANSWER:** According to the research completed by Kandil et al., (2016), a significant difference was found on the efficacy of pinch force needed for a tripod grasp pattern between a forward seated position and an erect seated position. The forward seated position indicated a stronger pinch force for a tripod grasp pattern, but with negative impacts to the child’s musculoskeletal system overall, along with increased muscle fatigue resulting in poor endurance. When in an erect position, the force patterns for pinch strength needed for a tripod grasp pattern was found to be more effective as it had less stressful impacts on the musculoskeletal system and indicated increased endurance patterns.

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## QUESTION: What Age do Fine Motor Skills for Handwriting Plateau?

**ANSWER:** As per research completed by Feder & Majnemer (2007), skills needed for handwriting plateau between 7 and 8 years of age and begin to become automatic.

## QUESTION: What Skills are Needed to Utilize an Efficient Pencil Grip?

**ANSWER:** A A: Research completed by Feder & Majnemer (2007) identified the following skills as necessary for the use of an efficient pencil grip: in-hand manipulation skills, translation, rotation and sensory awareness in the fingers.

According to research completed by Case-Smith (1993), in-hand manipulation skills were found to require forearm and wrist stabilization, controlled intrinsic movements and stable opposition of the thumb allowing the fingers to move freely.

## QUESTION: What is the Best Age Range to Address Fine Motor Skills for use of an Efficient Grasp?

**ANSWER:** Research completed by Case-Smith (1993) indicated that the critical age for development of in-hand manipulation skills is 3-4 years of age. It was also found that increased use of a tripod grasp pattern was noted with the development of in-hand manipulation skills.

## QUESTION: Does Handedness Effective Pencil Grasp Development?

**ANSWER:** Research completed by May (2010) indicated that handedness does not have a statistically significant difference on the development of pencil grasp development.

## QUESTION: What Does Research Say About Changing Pencil Grasp Patterns?

**ANSWER:** According to the research completed by Ratzon, Efraim, & Bart (2007), interventions with a focus on paper/pencil tasks for 30-35 minutes over the course of 12 weeks were found to significantly improve fine motor skills needed for graphomotor activities.

Research completed by Winslow (2011) indicated that small manipulatives, such as pop beads, had a positive effect on developing the intrinsic muscles of the hand, which are needed for use of an efficient pencil grip.

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Research completed by Rule and Stewart (2002) found that therapist directed fine motor tasks resulted in increased fine motor skills as compared to children who were only presented with a fine motor enriched curriculum.

Research completed by Schoen (2001) indicated that a Pencil Grasp Frame of Reference resulted in positive effects on overall pencil grasp patterns.

According to research completed by Case-Smith (2000) an emphasis on fine motor tasks in play was found to be effective in promoting development of fine motor skills.

### **QUESTION: What Does Research Say About Changing Pencil Grasp Interventions?**

**ANSWER:** As found in research completed by May (2010), Flip Crayons utilized in the Handwriting without Tears curriculum were not found to make a statistical difference in a child's grip pattern development over an 8 week time period. The use of Flip Crayons as the only writing utensil in the classroom should be studied further.

Research completed by Ohl et al., (2013) states that children who receive 10 weeks of RTI for visual motor, and fine motor skills including pencil grip, demonstrated statistically significant increases in overall skill. However, there was no significant change in pencil grip patterns. The STEPS-K curriculum was utilized during the 10 week RTI with an emphasis on structured fine motor stations, and direct occupational therapy services for 30 minutes one time per week. The fine motor stations focused on strengthening of the intrinsic muscles of the hands, pincer grasp exercises, finger isolation and separation of the two sides of the hand, translation, rotation and finger opposition.

### **QUESTION: What are the Best Classroom Modifications for Promoting Effective Pencil Grasps?**

**ANSWER:** According to the research completed by Kandil, Elkhair, & Ameen (2016), an erect position with a supported seat back is recommended to promote increased pinch strength and muscle endurance needed for a tripod grasp pattern.

Research on handwriting readiness by Winslow (2011) indicates that grips to correct pencil grasp should be firm, helps the student maintain proper web space, and prevents hyper-mobility of the thumb and index finger.

### **QUESTION: What is the Effect of Pencil Grasp on Speed and Legibility?**

**ANSWER:** According to research completed by Schwellnus, et al., (2012), no statistical difference was found in speed and legibility, when one of the four mature grasp patterns (dynamic tripod grasp, lateral thumb tripod grasp, dynamic quadrupod grasp, and lateral thumb quadrupod) were utilized during timed writing tasks.

Research completed by Schoen (2001) indicated that practice and repetition of pencil grasp activities resulted in increased legibility without positive effects on the pencil grasp pattern.

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## QUESTION: How Many Hours a Day Children Spend Completing Fine Motor Tasks?

**ANSWER:** According to the research completed by Kandil, Elkhair, & Ameen (2016), children between the ages of 3 and 7 spend 30% to 60% of their day engaged in fine motor activities including pencil grasp postures.

## QUESTION: What Does the Research Say About the Handwriting Without Tears Program?

**ANSWER:** Research completed by Maxwell (2010) indicates that regular exposure to the Pre-School Handwriting without Tears program in the classroom setting, with occupational therapy support, is beneficial to students with pre-writing deficits. It was further found that twice weekly individual services did not improve handwriting readiness, but may result in increased targeted fine motor skills.

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