

**Forearm, Hand,  
and  
Finger Control**

# FOREARM, HAND, AND FINGER CONTROL

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## Development

Control of arm and hand movement develops from the shoulder out to the fingers and from large, inaccurate movements to highly refined movements for specialized skills. To control fine movements, children must be able to hold some body parts steady (stabilize) while moving others. The progression of increased stability and mobility, starting from the shoulder and developing out to the finger joints, can be seen in the development of classroom arm and hand skills.

As drawing and writing skills develop, the focus of movement changes from the shoulder, to the elbow, to the wrist, to the knuckles (metacarpophalangeal joints), to the finger (interphalangeal) joints, and finally to the joints of the thumb, index, and middle finger as the last two fingers help to stabilize the hand. Scissor manipulation first involves shoulder movement and gross open-and-close hand motions. As children develop, stability increases at the shoulder, elbow, and forearm, until fine movements of the wrist, thumb, and index and middle fingers control cutting, while the arm and the last two fingers are primarily held steady. The stability and mobility needed for finer, more efficient movement patterns develop steadily throughout the first four years of life.

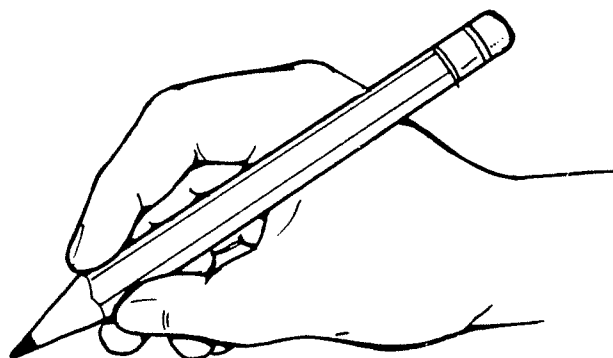
During their first year, children develop the ability to stabilize the trunk, to control large arm movements for reach, and to open and close the hand to grasp a variety of objects. The second year brings graded bending and straightening of the elbow, turning of the forearm to position the hand for grasp, and precise release of objects into small containers with wrist extended. All pinch-and-grip patterns are also developed during the second year, and the child progresses from holding a writing implement in the palm of the hand to holding it in the fingers. Although crayons or markers are held in the fingers, scribbling and drawing attempts still involve mostly whole-arm movement because of lack of wrist and finger control.

If scissor experiences are provided, between the ages of two to three years children learn to grasp scissors and open and close the hand to snip across paper. Large movements of the shoulder control the positioning of the scissors, because finer forearm and wrist control has not yet developed. The forearm and hand move as a unit, and the wrist begins to assist in achieving finer control of positioning and moving writing implements.

Three- to four-year-olds use finer movements of finger joints for manipulating small objects, and the hand moves as a unit during drawing and writing activities. The wrist begins to assist in controlling the position of scissors during cutting, keeping the scissors on the line and preventing them from shifting off

to either side. At this point, a tripod grasp usually develops for writing. The pads of the thumb and index fingers oppose each other, with the writing implement secured between them and supported by the side of the end of the middle finger. The last two fingers are bent (flexed) at the knuckle and provide stability for the hand arch which occurs at the knuckles (metacarpal arch). When this arch is stable, localized movement of the tripod begins to develop. The child is able to grasp the pencil closer and closer to the writing tip as the tripod grasp pattern develops.

Between ages four and six, tiny bending and straightening movements of the finger (interphalangeal) joints begin to control movement of the finger tripod that holds the writing implement, while the fourth and fifth fingers provide the stability needed for localized finger movement. The space between the thumb and the index fingers (web space) is held open in a position that maximizes the ability of the fingers to guide movement and grip pressure. This mature form of grasp—called the dynamic tripod—enables the child to efficiently control very small movements of the fingers. The child now shifts and maintains the pencil in a comfortable position with the fingers of the grasping hand, instead of constantly using the other hand to adjust it. The most mature form of handwriting involves stabilization of the elbow, forearm, wrist (in slight extension, or bent-back position), knuckles, and last two fingers while moving the shoulder and finger joints of the thumb, index, and middle fingers.



Cutting skills at this age also show a more stable shoulder, elbow, and forearm, while finger and wrist movements control most fine movement for scissor manipulation. Other manipulative skills parallel these increases with stabilization of some joints and finer, more differentiated movements of others. Children now can manipulate objects that are held in the hand by holding with the last three fingers and moving with the thumb and index, using reciprocal movements so the thumb moves one way while the other fingers move the other way to rotate objects in the fingers (for example, to unscrew a cap or turn a block over with the fingers); and they can shift objects smoothly from palm to fingers or fingers to palm.

The ability to stabilize the arm, wrist, and knuckles and to inhibit unnecessary movement, while using finer and more efficient movements of smaller muscles of the hand and fingers, develops progressively into the school years. When children enter kindergarten at the age of five or six, most have developed the prerequisite skills for using fine wrist movements, writing with finger movements, and for cutting with a stabilized upper arm and making small controlled snips. Many, however, have not yet learned the most efficient arm and hand positions for controlling pencil or scissor movement.

### **Poor Control of Forearm, Wrist, Hand, or Finger Movements**

Difficulty may result in this area due to sensory-integrative difficulties associated with learning disabilities, abnormal muscle tone, developmental delay, attention deficit, experiential variation, or normal individual differences in development. Children's rates of motor development vary widely, and some children are just slow to develop coordinated arm and hand movements due to their unique (yet entirely normal) rate of development or differences in childhood motor-learning experiences. Many children who are motorically or neurologically immature in comparison with their peers use patterns of movement that others normally use earlier. Children who have difficulty with motor planning (praxis) often use simpler, larger, and less efficient patterns of movement with less isolated movement of forearm, wrist, or fingers.

Many problems commonly seen in the classroom involve movement patterns that are normally used by younger children and involve larger, less differentiated muscle control. These include use of whole-arm movement for classroom activities (such as writing, drawing, coloring, cutting with scissors) when finer movements of the wrist and fingers would increase control; immature or awkward grasp patterns without use of finger movement; and use of gross hand grasps and both hands together for manipulating classroom objects instead of using finger grasp and movement.

A child must be able to extend the wrist and stabilize it in that position in order to oppose the pads of the fingers with the thumb for precise use of the fine muscles of the fingers (intrinsic) and for using writing implements. Lack of wrist extension and opposition of the thumb are often seen in early writing and scissor attempts; but if development remains fixed at this level, later it can interfere with performance when finer control and increased speed are needed.

Preschool children and those with more severe tone or neuromuscular disorders may have difficulty controlling the basic movements for arm and hand use, such as positioning the forearm for hand use, extending the wrist, grasping and releasing, pinching, and manipulating objects with the fingers.

Children who have difficulty with control of elbow stability and forearm movement constantly move their elbows during activities that require a firm base for hand movement, such as writing or cutting. Children who have difficulty rotating the forearm into a "thumbs up" (neutral or supinated) position may grasp and manipulate objects in a palms down (pronated) position. Children who avoid forearm rotation will often position the hand for activity by

lifting the elbow out to the side or lowering it in front of the body. Older children may continue to use this movement pattern to control scissors (as is normally done by the child up to age four or five).

Poor wrist stability or mobility can be seen when children write or use scissors with a bent wrist, a pronated grasp, or with the wrist pulled to the side (usually in the direction of the smallest finger). Other children may be unable to rotate the hand or make smooth up-and-down motions at the wrist when drawing on a chalkboard, or may move the wrist excessively when writing or cutting.

Difficulty with hand control can result in inability to grasp or release objects voluntarily, awkward or immature grip or pinch patterns after age 15 months, immature writing position, and difficulty controlling the open-and-close motion of scissors while inhibiting movement of the last two fingers.

At the age of five or six years, when children enter kindergarten, most have developed the finger control necessary for learning the dynamic tripod grasp for holding writing implements, and some are using this position naturally. Many of the immature or abnormal grips seen in the classroom are related to lack of fine finger control. Some children do not yet have the stability at the wrist or knuckle joints or the fine finger control to use a mature grasp pattern. Others habitually use an immature grasp pattern even though their fine finger control is now adequate for using a more mature pattern. When deciding how to manage an immature or awkward pencil grip, it is important to determine whether finger control is adequate for a more mature pattern.

If finger control is weak, you will note other difficulties, such as inability to rotate objects in the hand with the fingers so that both hands must be used, using the other hand to constantly shift the pencil position, inability to rotate a pencil in the hand to erase, use of wrist or forearm movement instead of finger movement for manipulating toy nuts and bolts, difficulty turning pages, dropping objects, and difficulty buttoning buttons.

## **Beneficial Activities**

The choice of helpful activities depends on the problem. If the child is using large arm movements with little isolated wrist, hand, or finger movement, encourage activities that require finer movement, and inhibit larger movements physically or with verbal reminders. Children who are having difficulty with isolated movements such as supination of the forearm or extension of the wrist can be encouraged to engage in activities that require these positions. Children who are having difficulty using mature pinch patterns or opening and closing scissors can learn these through practice of similar movements.

Weight-bearing activities are excellent for improving a variety of arm and hand functions. These can be used in preparation for the kinds of activities described above. Bearing weight through well-aligned joints stimulates the muscles around the joints and increases stability. The weight also provides added proprioceptive information (about joint position and movement) to help to develop control of smaller midrange movements. When muscles are not used often, the opposing muscles on the other side of a joint are unbalanced and can shorten. When this occurs, weight bearing and shifting can help to lengthen the shortened muscles, which is necessary before encouraging the child to use

the muscles that pull against them. For example, if a child does not use an extended wrist while using the fingers for a precise activity, the muscles that bend the wrist (flexors) might be shortened. If so, wrist extension will be difficult unless the flexors are lengthened. Weight bearing on straight arms, with the wrist extended to 90 degrees, can help to lengthen the muscles that bend the wrist and make wrist extension easier. This can be helpful before practicing activities that encourage active wrist extension and finger use in extended wrist position.

Looking around at adults writing checks at a checkout counter will quickly convince you that there are a number of functional grips, and that the dynamic tripod is not necessarily the best position for all hand shapes and sizes. It is a good position, however, for teaching a child to use part of the hand for stabilizing, and for developing the tripod for achieving small finger movements with good control. It's fine if the child later develops an individualized form of tripod or a similar position that uses four fingers, as long as the grip allows fine movement of the finger joints, an open web space, and a stable hand position. If a child is unable to use a tripod position because of weak control of fine finger movements, provide a variety of activities and games that help to develop awareness of the fingers and coordinated finger movement. Dysfunctional grasp patterns are difficult or impossible to change once they become habitual, so grasp of a writing implement should be taught and reinforced early in the kindergarten and first grade. A child who uses a pencil grip that does not utilize fine movements of the finger joints will never achieve the speed, precise control, or ability to adjust writing pressure that is possible with a tripod (or four-finger) grip position. If grip is interfering significantly with classroom writing performance, work to improve the grip pattern and use of the fingers is well worth the effort for some children.

## Compensatory Strategies

When incoordination interferes with classroom performance and is not improving regardless of practice, easier classroom activities are appropriate. Devise methods that do not require the difficult movements.

- If finger movement is weak, allow the child to write with large movements on wider-lined paper or on the chalkboard. These techniques will enable child to use whole-arm movement exclusively.
- Children who have difficulty stabilizing the elbow at 90 degrees for table work can lie on their stomachs, propped on elbows, for writing or drawing. The arms are stabilized in this position.
- Children who are unable to control fine finger movements for buttoning small buttons can use larger buttons or Velcro® closures.
- Flexible-loop scissors open automatically and eliminate the need for combining grasp and open-and-close motions of the hand.
- A child who uses an awkward pencil grip that does not utilize finger movements for writing will write more slowly and with less precision than other children. Allow extra time for writing assignments, and focus on legibility instead of neat appearance.

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Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**

**GRADED FLEXION AND EXTENSION OF ELBOWS**

**Purpose**

To increase control of bending (flexion) and straightening (extension) of elbow

**Preparation**

If stiffness or low tone is a problem, carry out activities to normalize tone before working on this activity.

**Procedure**

1. Warm-up activities. Provide a few minutes of activities that provide extra kinesthetic input (information about position and movement from the joints and muscles) during flexion and extension movements. A few examples are:

- Weight bearing and weight shifting in all-fours position on straight arms. Child slowly bends one arm so weight shifts onto it, then straightens the arm to slowly shift the weight back to the other arm.
- Child bends both arms slowly and then pushes back up in this position.
- Weight bearing on one arm. In a side-sitting position, the child slowly bends the elbow of the supporting arm and then straightens it. Child repeats on the other side.
- Child makes the transition from sitting to lying down and back up, using arms to let body weight down slowly and push weight back up.



2. Practice activity. Warm-ups are followed immediately by a fine motor activity in which child practices the desired bending and straightening movements. A few examples are:

- Straightening arm to reach for an object held in front of the body.
- Straightening arm to reach for objects (such as crayons or classroom manipulatives), then bending arm to place them in a box placed near the body.
- Large scribbling with crayon over textured surface, using bending and straightening motions of the arm.

- Playing a drum or xylophone
- Hammering with a hammer or mallet
- Sawing with a saw
- Stirring batter
- Rolling clay or dough with a rolling pin
- Weaving on a loom
- Throwing a ball
- Hitting a balloon on a string

**Desired Response**

Child bends and straightens the arms in a controlled manner.

**Undesired Response**

Child's elbows remain straight or bent, and the trunk moves to accomplish the activity.

**Variations and Adaptations**

Child performs a warm-up activity before any fine motor activity that requires flexion or extension of the arm.

If child is unable to control movement at the elbow, assist with control by providing physical assistance at the elbow and forearm. Decrease the amount of help as child's control improves.

Provide physical assistance as needed for weight-bearing activities. Support as much body weight as you need to, and decrease your support whenever possible. For example, in side-sitting, place one hand on child's upper trunk so you can support some body weight, if needed, as child bends and straightens the supporting arm.

If child tends to have involuntary arm movements with extreme bending and straightening, work first on larger flexion and extension movements; then decrease the size of the movements required to improve control of midrange movement.

Practice reaching with straight arm with the forearm in various positions (such as palm down to pick up block, thumb-side up to pick up a cup or cylindrical bottle, and palm up to hit a balloon).

*Use of these activities should be directed by a qualified therapist.*



Child's Name \_\_\_\_\_

Date \_\_\_\_\_

FOREARM, HAND, AND FINGER CONTROL  
Classroom and Individual Practice

**STABILIZING THE ELBOW FOR FINE MOTOR ACTIVITY**



**Purpose**

To improve stabilization of the elbow at 90 degrees of flexion

This elbow position is necessary for effective hand use on a table surface.

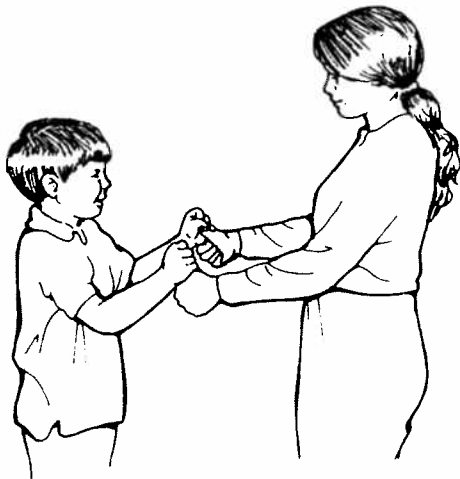
**Preparation**

If stiffness or low tone is a problem, carry out activities to normalize tone before working on this activity.

**Procedure**

1. Warm-up activities. Provide a few minutes of activities that stimulate the muscles on both sides of the elbow to contract (cocontraction). A few examples are:

- Weight bearing and weight shifting in all-fours position on straight arms. Child slowly bends one arm so weight shifts onto it, then straightens the arm to slowly shift the weight back to the other arm.
- Child makes the transition from sitting to lying down and back up, using arms to let body weight down slowly and push weight back up.
- Child "freezes" arms by holding them stiff, with elbows bent to 90 degrees and hands gripping your thumbs. Move your thumbs forward, then backward, with rapid, unexpected changes in direction while child attempts to keep elbows from bending or straightening.
- Child sits in chair, with elbows bent at 90-degree angle, wrists extended, and palms resting against the closer edge of the table or desk. Child leans forward and supports body weight on hands, with elbows held stiff at 90 degrees.



2. Practice Activity. Warm-ups are followed immediately by a fine motor activity in which child practices the desired position, such as scribbling, drawing, writing, cutting with scissors, buttoning buttons, cutting food with knife and fork, or doing math activities with manipulatives.

**Desired Response**

The student maintains elbows in about 90 degrees of flexion during fine motor activity.

### **Undesired Responses**

Child's elbows straighten or bend with movement of the shoulders or hands. Child supports body weight on forearms on work surface so that cocontraction at the elbow is not required and movement is limited.

### **Variations and Adaptations**

Child performs these stabilizing warm-up activities before any desk-top fine motor activity.

If child is unable to stabilize the elbow in this position, provide physical assistance at the forearm or wrist to assist with maintaining a stable elbow position. Decrease the amount of help as child's ability to maintain the position improves.

Repeat a warm-up activity if stability decreases during the fine motor activity.

Start with a fine motor activity that is easy for the child, and increase the level of difficulty as long as elbow stability can be maintained. For example, encourage the child to maintain a stable elbow while cutting a straight line; progress to more difficult cutting tasks only when this is accomplished easily.

*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**

**FOREARM SUPINATION AND PRONATION**

**Purpose**

To improve rotation of the forearms so the hands can be oriented in a palms-up (supinated) or palms-down (pronated) position for fine motor activity

**Preparation**

If stiffness or low tone is a problem, carry out activities to normalize tone before working on these activities.

**Activities**

Encourage forearm rotation whenever possible during the child's daily schedule.



1. Provide a warm-up activity to lengthen tight muscles so child can rotate forearms more easily.
  - Child lies on stomach, propped on elbows and supporting weight on forearms. Child starts with both forearms in a neutral position so that both hands are positioned with thumbs on top. Child shifts weight from one forearm to the other, with the weight shift and resistance of the floor surface assisting with forearm rotation. The weight-bearing forearm is palm-up and the other is palm-down. As weight shifts, this is reversed. Child repeats this several times before proceeding to an activity that will use these forearm rotation patterns.
2. Encourage activities that require rotation of the forearm:
  - Turning doorknobs with the palm on the front of the knob (not the side, which requires wrist extension instead of forearm rotation).
  - Turning radio or television knobs both ways.
  - Turning over blocks or animal-sound cylinders. Letters or numbers can be written on the bottom of blocks and incorporated into games.
  - Pouring from one container to another or from pitchers into cups.
  - Winding wind-up toys.
  - Using keys or toys with keys.
  - Placing stickers or drawing faces on the palms, which requires the child to turn the hand over to see the picture.

- Using cups to cut circles out of clay or cookie dough. Child holds the cup with the thumb-side of the hand on top and turns it over, using forearm rotation, to cut out the circle or cookie.
- Wringing out washcloths, rags, and towels.
- Turning over paper or index cards.
- Scooping food and bringing it to the mouth with utensils.
- Using a spoon to scoop liquid or food from one container and dump it into another.
- Using a knife for spreading food.
- Feeling surfaces and textures with the front and back of the hand.
- Placing cups in a dishwasher.
- Playing a "Give me five" clapping activity. Children or child and adult clap each other's hands with alternating supination and pronation. One claps first with palms down (to clap on the other's hands, which are palms up), then rotates forearms into palms-up position while the other person claps downward with palms down.



3. Provide verbal and physical cues to encourage forearm rotation whenever appropriate for classroom and self-care activities such as those described above.

- If elbow moves toward and away from the trunk to position the hand (instead of forearm rotation), hold the upper arm against child's rib cage, or encourage child to do so.
- If child is unable to rotate the forearm for these activities, provide assistance with forearm movement by holding and rotating at the wrist or just below the elbow.
- Encourage child to stabilize elbows on a desk surface or on the floor in prone-on-elbows position, if rotation is difficult without this stability.

**Desired Response**

Child rotates the forearm to orient the hand in palms-down and palms-up positions during hand use.

**Undesired Responses**

Child brings the elbow in front of the trunk (humeral adduction) or away from the trunk (humeral abduction); or moves the trunk from side to side to change the position of the hand, instead of rotating the forearm.

**Variations and Adaptations**

For some activities it is helpful to first work on forearm rotation with the upper arm stabilized. Have the child support the elbow on the table surface while you provide physical support at child's shoulder,

if needed; or provide support at both the shoulder and elbow. Work toward removing this support as child's rotation improves in a stabilized position.

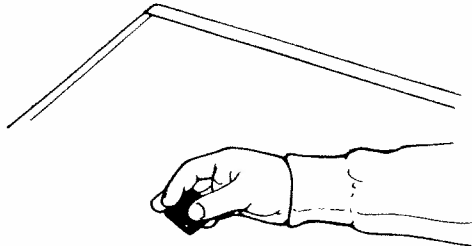
Encourage rotation of both forearms. Also encourage bilateral activities, such as wringing out washcloths, playing "give me five," or pouring from one container into another and then back again using the other hand.

*Use of these activities should be directed by a qualified therapist.*

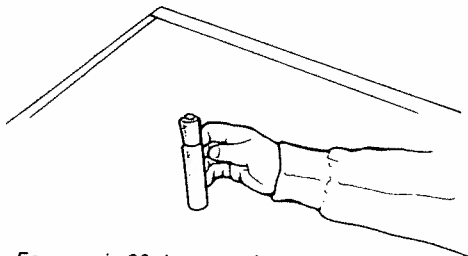
Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**  
**FOREARM SUPINATION**



*Forearm in 30 degrees of supination*



*Forearm in 90 degrees of supination*



**Purpose**

To improve the child's ability to position the forearm in a palms-up (supinated) or neutral (thumbs-up) position for fine motor activity

About 30 degrees of supination is the minimum needed for fine manipulation of materials on a table top; but try to help the child develop at least 90 degrees (thumbs-up position) for optimal hand use.

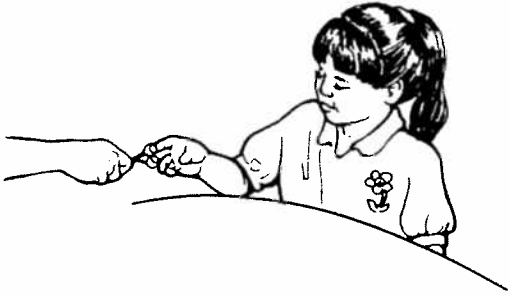
**Preparation**

If stiffness or low tone is a problem, carry out activities to normalize tone before working on these activities.

**Activities**

Encourage supination whenever possible during the child's daily schedule.

1. Provide warm-up activities to lengthen tight muscles so child can supinate forearms more easily.
  - Child sits at desk or table, with forearms resting on surface and hands turned so thumbs face forward. Child leans forward and supports weight on forearms, with elbows bent. Child shifts weight from one forearm to the other, and weight shift assists the weight-bearing forearm into a palms-up (supinated) position and the nonweight-bearing forearm into a palms-down (pronated) position. Child repeats this shifting, so forearms alternate between pronated and supinated positions.
  - This can also be done with the child lying on stomach, propped on elbows and supporting weight on forearms. This position may be easier for children who find the activity difficult, as described above. The added weight and resistance of the floor surface encourage more forearm rotation.
2. Encourage activities that require palms-up and thumbs-up positioning, such as:
  - Shaking hands.
  - Catching a large ball with both hands.
  - Making the "thumbs-up" sign with both hands to indicate "yes."
  - Pulling vertical door or cabinet handles.
  - Grasping and pulling up on vertically hanging ropes.
  - Picking up the telephone and bringing it to the ear for conversation.
  - Placing cans on shelves.



3. Hand objects to child in a vertical orientation, so that child must supinate the forearm for grasp.
  - Hand large cylindrical pegs with pegs oriented vertically, so child must supinate to grasp. Place the pegboard flat on a surface so pegs must be oriented vertically for placement in the holes.
  - Give pencils, crayons, and other writing implements to child in a vertical position.
  - When assisting child in grasping scissors, hold scissors with loops toward child, one on top of the other, to encourage a supinated forearm position during scissor use.
4. Use verbal and physical cues to encourage supinated positioning whenever appropriate for classroom and self-care activities:
  - Turning doorknobs.
  - Drawing or writing.
  - Cutting with scissors.
  - Grasping and manipulating small objects.
  - Drinking from a cup.
  - Bringing a spoon to the mouth.

#### **Desired Response**

Child supinates the forearm to orient the hand for use, with the palm or thumb up.

#### **Undesired Responses**

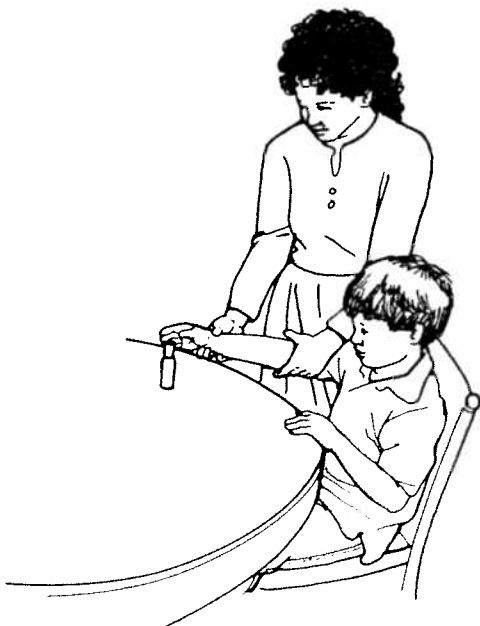
Child brings the elbow in front of the trunk (humeral adduction) or moves the trunk to orient the hand, instead of rotating the forearm. Child grasps objects from the top, with the palm facing down or with the thumb on the bottom.

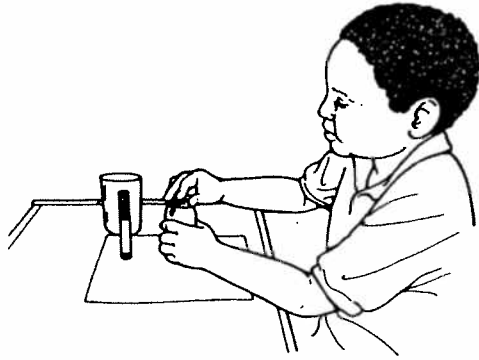
#### **Variations and Adaptations**

If child is unable to rotate the forearm for the activities described above, provide physical assistance at the elbow and wrist, if needed, to assist with forearm rotation.

For some activities (cutting with scissors, eating with a spoon, drinking from a cup, or manipulating small objects on a table surface), it is helpful to first work on forearm rotation with the upper arm stabilized. Have child support the elbow on the table surface while you provide physical support at the child's shoulder, if needed. Work toward removing this support as child's rotation improves in a stabilized position.

If child uses movement of the upper arm instead of forearm rotation to place the hand in a supinated position, encourage child to hold the upper arm (humerus) against the rib cage to prevent compensatory upper arm movement during activities in which supination is desired.





Supination is easiest when the elbow is fully bent (flexed). For all of the activities above, start with elbows flexed more than 90 degrees; gradually place objects (ball, hand for shaking, drinking cup, and so on) farther away to encourage supination with a straight arm.

Encourage supination of both arms. This position is needed for stabilizing objects with the nondominant hand for bilateral (both-hands) activity. For example, child will need to supinate the nondominant hand to hold a jar while the lid is unscrewed by the dominant hand.

If child can supinate the arm but has poor control, provide lots of desk-top activities, with forearm supported and manipulation of objects that are oriented vertically.

*Use of these activities should be directed by a qualified therapist.*



Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**  
**WRIST STABILITY**

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**Purpose**

To improve the child's ability to maintain the wrist in a functional position (straight or bent back slightly) during fine motor activities

These positions are necessary for control of precise finger movements.

**Preparation**

If stiffness or low tone is a problem, carry out activities to normalize tone before working on these activities.

**Activities**

Warm-up activities. Provide a few minutes of activities that lengthen the muscles that bend the wrist and stimulate the muscles on both sides of the wrist to contract (cocontraction). A few examples are:

1. Weight bearing and weight shifting in all fours (hands-and-knees position) on straight arms, with open palms and fingers pointing straight in front of the body. While keeping arms straight, child rocks forward and backward, from side to side, and diagonally.

This can also be done in a standing position, with child shifting weight over open palms and outstretched fingers on a secure table surface.

2. Two children (or child and adult) face each other in standing or sitting position, place their palms together with wrists extended (bent back), and push against each other's palms.
3. Child grasps adult's fingers or a dowel or pencil held vertically, with child's wrist held straight or in slight extension (bent back). Adult moves the grasped fingers, dowel, or pencil quickly and unexpectedly in different directions (always maintaining the vertical position of the dowel or fingers), using small movements, while child keeps the wrist from moving.

Practice activities. Warm-ups are followed immediately by a fine motor activity that encourages use of the wrist in a neutral (straight) or extended position. A few examples include:

- Pulling out strings of putty or dough with wrist straight.
- Using both hands to press clay into a large ball.
- Writing on chalkboard or large mural paper, above eye level.



- Using a rolling pin to roll out dough or clay.
- Pushing push toys with straight wrist.
- Using stamps and ink pad (positioned vertically) to make designs on a vertical surface (such as large paper on the wall).
- Cutting clay, dough, or food with knife and fork.

**Desired Response**

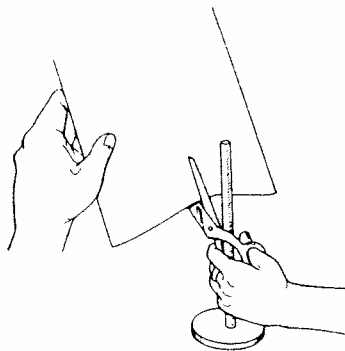
Child maintains wrist in straight or slightly extended position during practice activity.

**Undesired Response**

Child's wrist is bent or moves into different positions during hand use.

**Variations and Adaptations**

Child performs these stabilizing warm-up activities before any desk-top fine motor activity (especially writing and cutting with scissors, which depend on a stable wrist for precise finger movement).



If child is unable to stabilize the wrist in this position, provide physical assistance by applying slight support to each side of the wrist with your hand during fine motor activities that require precise finger movements. Provide only as much assistance as the child requires, and decrease it as the child's stability increases.

If child is unable to maintain a stable straight or extended wrist during fine motor activity, a cock-up splint may be helpful. Consult a therapist for fabrication.

Provide a dowel mounted vertically on a base to assist a child who has poor wrist stability during scissor use.

A writing frame is often helpful for children who have instability at the wrist but good control of finger movements.



*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

FOREARM, HAND, AND FINGER CONTROL  
Classroom and Individual Practice  
**STABILIZING AND MOBILIZING THE  
ULNARLY DEVIATED WRIST**

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**Purpose**

To improve the child's ability to keep the wrist straight and to move it in all directions during hand and arm use

The ability to stabilize the wrist in a straight position is needed for balanced use of the small muscles of the hand and for using the thumb in its optimal position.

**Materials**

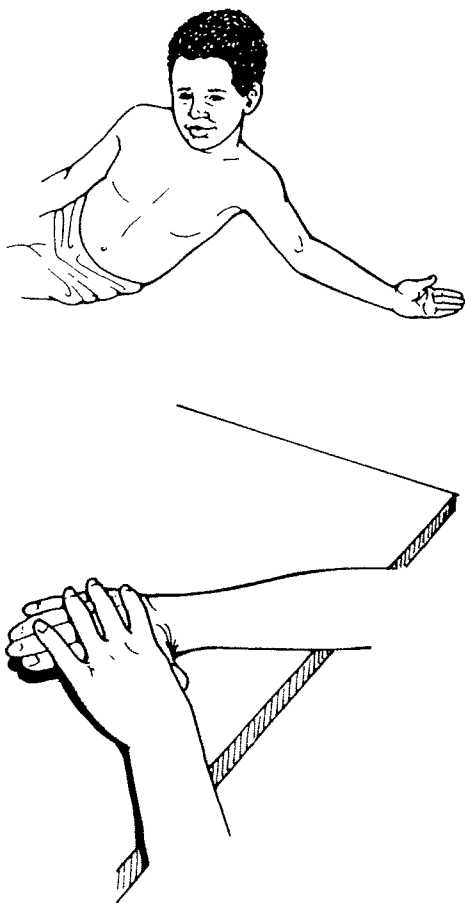
Chalkboard or paper taped on wall; chalk or crayon; silicone putty or elastic Thera-Band® or strip of rubber inner-tube material

**Activities**

Have child do these activities daily, if possible, to lengthen the shortened muscles that pull the hand to the small finger (ulnar) side, and to strengthen the muscles that pull the wrist up and in the direction of the thumb side (radially).

*To stretch the muscles that pull the hand to the ulnar side:*

- Child lies on side, supporting weight on the side of the forearm and hand, with elbow bent. Child straightens elbow (as much as possible) while continuing to bear body weight on the side of the hand. Make sure that the side of the hand stays down on the floor so the wrist bends. Child works toward full straightening of elbow, with entire side of hand on the floor. Child repeats 10 times. Then child lies on other side and repeats with other arm and hand, if needed.



*To strengthen the muscles that pull the hand up and to the radial side:*

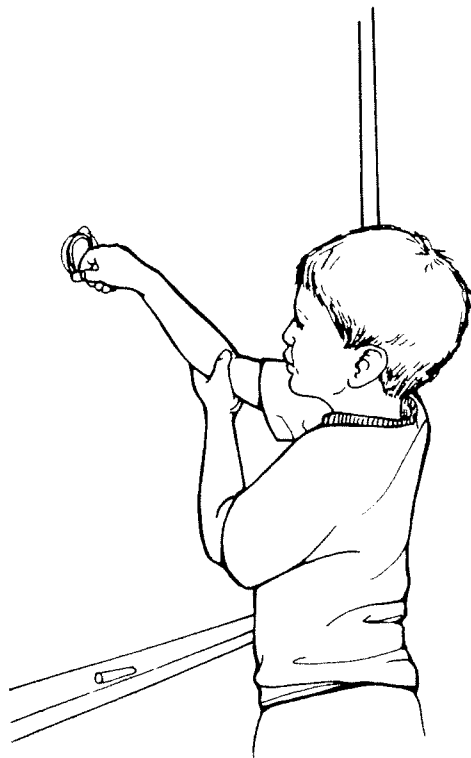
- Child places hand under a table top or other hard surface, with thumb side on top. Without moving shoulder or forearm (just the wrist), child presses up against the table top with the hand as hard as possible, then releases. Child repeats 10 times. Make sure the child is pressing up with the hand, not pulling up with the arm.
- Child rests forearm on a table, with ulnar side of one hand resting on surface. Child places other hand on top of the thumb side of the bottom hand, and pushes down with the top hand as the bottom hand pushes up toward child's chest. Child repeats 10 times, switches hand positions, and repeats. Again make sure child is pushing with the hand and not the whole arm.



- Child holds silicone putty, clay, or elastic Thera-Band® in one hand. While holding the forearm of the other hand steady, child uses wrist motion to pull the material up and in the direction of the thumb. Child repeats 10 times, changes hands, and repeats.

*To increase the mobility of the wrist:*

- Child bends elbow and positions forearm and hand so palm faces the floor. Without moving the forearm or upper arm, child makes smooth circles with the hand, starting with small circles and progressing to larger and larger circles. Child starts with a straight wrist and does not move the arm. Focus on trying to increase the extent that the wrist bends to the radial (thumb) side during circles. Repeat 10 times. If necessary, you (or child) may support the forearm and prevent it from moving by holding it gently just above the wrist; but try to progress to holding the forearm still without this.
- Child practices the same motion by drawing circles on a chalkboard or paper taped on the wall. Child uses wrist motion only, focusing on smooth rotation of the wrist to make circles while keeping the rest of the arm still. Child repeats 10 times.



**Desired Response**

In the stretching activity, child keeps the side of the hand on the floor and straightens the arm. In the strengthening and mobility activities, child separates movement of the hand from the forearm, to press upward and toward the thumb side and to rotate the hand in all directions.

**Undesired Response**

Child moves the whole arm instead of initiating movement of the hand at the wrist.

**Adaptations and Variations**

Child performs these lengthening and mobility exercises before any fine motor activity. The correct wrist position is monitored and reinforced during the activity.

Physical support can be provided to maintain the wrist in a straight and slightly extended position during finger activities. Hold the ulnar side of the hand and the radial side of the forearm just above the wrist. Reduce support as stability improves.

A splint may be useful if stability cannot be maintained in this position.

Working on fine finger activities while bearing weight on the ulnar side of the forearm helps to maintain the length in the muscles during hand use. Child can bear weight on the ulnar sides of the forearms while leaning forward in a sitting position with forearms resting on a desk or table or while lying on stomach in prone-on-elbows position.

These are good positions for cutting with scissors, coloring, or playing with small objects. If the wrist bends sideways or forward, provide slight physical support with your hand to keep the forearm down on the surface.

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*Use of these activities should be directed by a qualified therapist.*

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Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**  
**WRIST EXTENSION**

**Purpose**

To improve the child's ability to extend (bend back) the wrist for hand use

This position is important for developing precise finger skills.

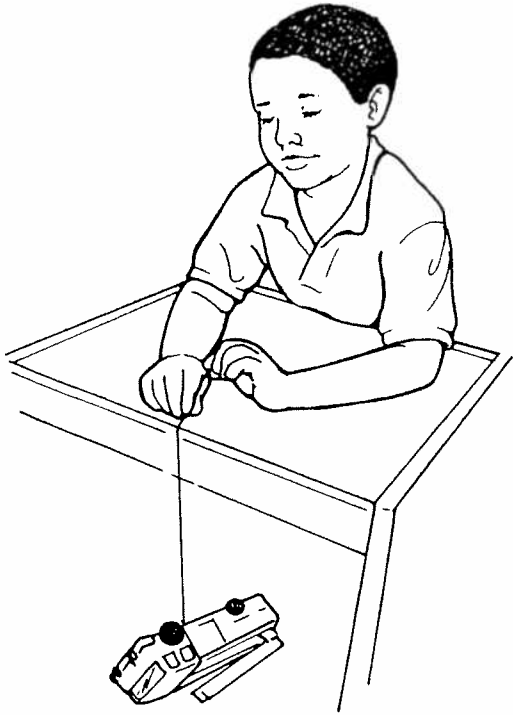
**Preparation**

If stiffness or low tone is a problem, carry out activities to normalize tone before working on these activities. If flexor muscles (which pull the wrist forward) are shortened or wrist stability is a problem, provide a few minutes of activity to promote wrist stability before encouraging wrist extension.

**Activities**

1. Provide opportunities for practicing this movement pattern as much as possible throughout the day. Any activity that requires bending back (extension) of the wrist is helpful. A few examples include:
  - Waving goodbye
  - Writing, drawing, or scribbling above eye level on a chalkboard or large mural paper (Encourage this during writing practice or classroom games.)
  - Hitting balloons or balls upward and overhead. Suspend balls or balloons from a string overhead, or play a volleyball type of game
  - Cleaning chalkboard with eraser or wet paper towel
  - Playing "cat's cradle"
2. Present materials from above eye level to encourage wrist extension during reach and grasp. Move material higher, request wrist extension, or assist physically if wrist extension does not occur automatically.
3. Present activities in vertical orientation whenever possible. Pegboards, lacing boards, painting, or Etch-a-Sketch® activities when positioned vertically will encourage wrist extension during finger use.
4. Have child play with resistive materials. Child stabilizes forearms on the table and holds the clay, dough, or putty with one hand. Child grasps the material with the thumb and first two fingers of





the other hand and pulls the wrist back to pull up “peaks, hills, or strings,” without moving the forearms. Alternate hands to increase extension of both wrists.

5. Have child pull up weighted toys. Tie toys or other weighted objects onto a string and hang them off the far edge of the desk or table, with the other end of the string in the child’s hand. Child supports forearms on desk or table surface and uses wrist extension of both hands alternately to grab the string and pull the toy up. Encourage pinch of the string with the thumb and first two fingers as child pulls up the toy. Increase the weight of the toy to increase strength.
6. Child plays table-tennis ball games. Children sit on either side of a table, facing each other, with dominant forearms resting on the table, wrists straight, and the backs of their hands facing each other. They are allowed to hit the ball only by flipping it with the backs of their hands, using wrist extension. They can position the “flipper” with arm movement, but they must keep the forearm parallel to the front of the table. The object of the game is to hit the ball off the opponent’s side of the table (or into a goal). Action is repeated using the nondominant hand.
7. Encourage child to throw a Frisbee® using primarily wrist movement.

**Desired Response**

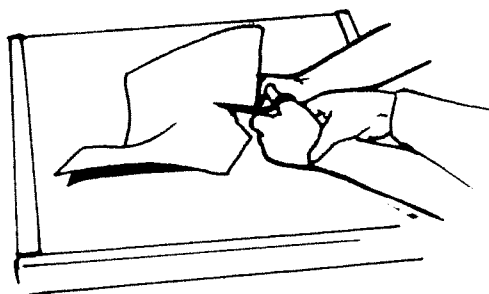
Child bends the wrist back and maintains this position when appropriate during fine motor activities.

**Undesired Response**

Child uses forearm movement instead of wrist movement, or assumes a position with bent or straight wrist during these activities.

**Variations and Adaptations**

If extensor strength is a problem, grade activities so that resistance to the bending-back movement of the wrist is initially low and increases gradually as strength increases. For example, in chalkboard activities, wrist extension is not resisted and is actually assisted by the chalkboard, which helps to hold the wrist up. In the table-tennis ball games described above, the wrist is extending with the pull of gravity eliminated. This can be made even easier by placing powder or cornstarch on the table surface so it provides less resistance to movement. In pegboard activities that are oriented vertically, child bends the hand back against the pull of gravity. In the weighted toy and resistive material activities, increased resistance is added to the pull of gravity; it can be increased by adding more weight or using a stiffer putty or clay.



If child is unable to stabilize the wrist in an extended position, provide physical assistance by applying slight support to each side of the wrist with your hand during fine motor activities that require precise finger movements. Provide only as much assistance as is required, and decrease it as stability increases.

If child is unable to maintain an extended wrist position during fine motor activity, a cock-up splint may be helpful. Consult a therapist for fabrication.

Etch-a-Sketch® is a registered trademark of Ohio Art Company.

Frisbee® is a registered trademark of Wham-O Manufacturing.

*Use of these activities should be directed by a qualified therapist.*



Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL  
Classroom and Individual Practice**

**GRASP**

**Purpose**

To develop the open-and-close hand motions needed for grasping objects

**Preparation**

Normalize tone and touch responses (techniques for increasing tactile contact) if child has high or low tone in the arm and hand or avoids touch. Repeat these during grasp activities, if needed.

**Position**

Child sits in well-supported position, with forearms resting on a work surface. Stabilize child's arm with the wrist straight or bent back slightly and hand positioned with thumb-side up (90 degrees of supination).

**Procedure**

Development of grasp takes time and repetition of the desired hand movement. Encourage child to repeat the grasp movement pattern as often as possible throughout the day in a variety of activities.



1. Encourage grasping skills in the following progression:
  - a. With child's hand and wrist stabilized in the desired position, grasp the object in your fingers and present it directly to child's fingers. Wait for child to open the fingers. Put the object between child's fingers, and wait for child to close the fingers.
  - b. When child can grasp in the manner described above, place the object on your palm and present it. Wait for child to grasp it.
  - c. When objects are grasped from your palm easily, place object on the table near child's hand. Ask child to grasp it.
  - d. As the child's grasping ability improves, gradually move the object farther away. Stabilize the forearm and wrist while child grasps with a straighter elbow.
2. Present activities that encourage active exploration of objects and textures with open hands or open-and-close hand motions. A few examples are:
  - Feeling materials with different textures, shapes, and sizes.
  - Playing with clay or cookie dough.
  - Rolling a rolling pin.

- Popping bubbles with open-and-close hand movements.
- Exploring with hands to find small toys and other objects hidden in uncooked rice, macaroni, corn, cereal, or packing foam "peanuts."
- Grasping medium-sized hard cookies (or other firm food items) placed near the child's hand.

### Desired Response

Child straightens and bends fingers to hold object securely in the hand; fingers adapt to the shape of the object.

### Undesired Responses

Wrist bends and straightens to mechanically open and close the fingers. Fingers hold the object without adapting to its shape. (The hand does not comfortably surround the object; some fingers may be straight, some joints may be bent back, and so on.)

### Variations and Adaptations

When child can grasp objects with elbow bent or straight, combine grasp with reach by placing objects on the table surface farther and farther from the body and encouraging child to reach to grasp them.

When child can reach and grasp objects with the arm on the table or other surface, encourage reaching and grasping objects in space (for example, an object presented to the child in the air). Again, start close to child's body and progress to farther away.

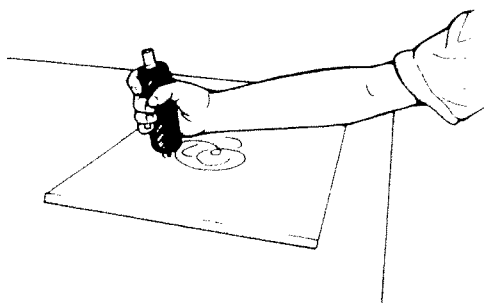
First encourage palmar grasp (with objects held by fingers against palm); then present objects directly to the thumb and first two fingers to encourage radial palmar grasp (thumb on the opposite side of the object from the fingers, thumb and fingers holding the object against the palm). Next, present objects to be grasped with the pads of all of the fingers (instead of pulled against the palm); then present to the pads of the thumb and first two fingers.

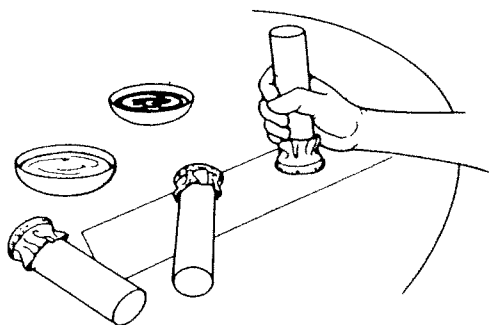
If child is unable to grasp an object from a table surface for classroom activity, stabilize child's wrist (in a straight position) and present the object directly to the fingers.

If child's hand is fisted, place objects in the palm, with thumb on one side and fingers on the other.

If child drops objects placed in the hand, place the object firmly into the palm and hold over child's hand to maintain grasp. Decrease your support and encourage child to maintain grasp for increasing periods of time.

For a child with spasticity, grasp of sharp-cornered objects (such as cube-shaped blocks) may be painful. Have child practice grasp using cylindrical or round objects. Dowels and the 4-inch cylindrical blocks





that come in large wooden block sets are excellent for this. Once a palmar grasp of this shape is developed, it can be used for many activity adaptations. A few examples include:

- Painting (or painting over stencils) with dowels that have sponge taped onto one end
- Coloring with thick chalk or writing implements that have built-up handles, held in a palmar grasp
- Holding eating utensils with built-up handles
- Stamping designs, letters, or a signature with a dowel that has interchangeable stamps attached to one end with Velcro®

If child has difficulty adapting hand shape to the shape of the object, provide lots of round and cylindrical objects for child to practice grasping to help shape the fingers.

Use a dowel 1" or 1½" in diameter, about 20 inches long, for practicing grasp patterns. Hold it vertically against the table surface so child practices grasping with forearm stabilized on the table and gradually reaches to grasp the dowel at spots marked farther and farther up. Start with the dowel close to child's body, and move it farther away as skill improves.

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*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**  
**VOLUNTARY RELEASE**

**Purpose**

To develop the ability to open the fingers to release objects at will

**Preparation**

The ability to relax the muscles that bend the fingers is critical for controlling release. Normalize tone before working on release; repeat during the activity, if needed. If wrist extension is limited, work on this before expecting the child to release with wrist extended.

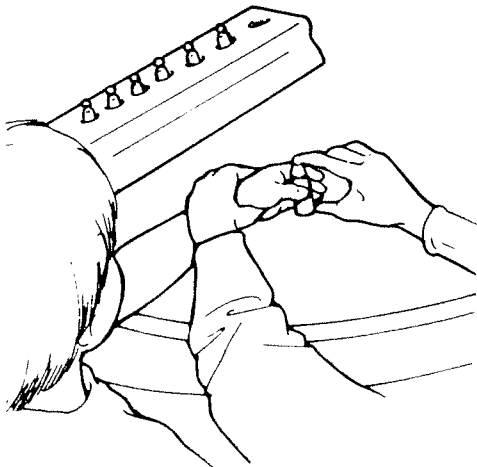
**Position**

Child sits in well-supported sitting position, with forearms supported on a work surface. Wrist and elbow of grasping arm are straight.

**Procedure**

Development of release takes time and repetition of the desired hand movement. Encourage child to repeat the releasing movement pattern as often as possible throughout the day, in a variety of activities. Encourage release in the following manner:

1. Grasp the object which child is holding, stabilizing it.
2. Use your other hand to bend child's wrist forward very slightly, and rub and stroke the muscles on the back of child's hand with your fingers to encourage child's fingers to straighten.
3. Allow time for child to straighten fingers to release the object.
4. Once child has released the object successfully several times, repeat the procedure but encourage child to release while maintaining a straight wrist without your stimulation of the muscles.



**Activities for Practicing Release**

- Stacking blocks.
- Playing with pegboards.
- Dropping balls.
- Playing with squeeze toys and wet sponges.
- Transferring objects from one hand to another. (Make sure the child is releasing and not just pulling object out with fingers of the other hand.)

- Putting objects into containers (for example, putting away classroom manipulatives or toys at home).
- Dropping objects into cans of various sizes for a target game.
- Handing crayons and pencils to the teacher or another child.
- Playing with foam balls and a Velcro® target. Child can release ball directly onto the target, so the ball sticks to the target and is stabilized during release. Later, child can progress to dropping ball from just above the target.

### **Desired Response**

Child opens fingers to release object.

### **Undesired Responses**

Child pulls object out of the grasping hand with the other hand; pulls the arm back so a stabilized object is released without finger control; “flings” the arm so the object flies from the hand; bends the wrist forward to mechanically open the fingers with no active finger opening.

### **Variations and Adaptations**

If the child is unable to release stabilized object, assist with release by pulling the object slightly when you feel the child trying to open the fingers. Decrease and eventually remove assistance as the child releases more completely.

When the child can release objects that are stabilized (externally held in one position), encourage release of objects that are not stabilized. For example, have the child release blocks into a can without your holding the block during release.

When the ability to release with a straight wrist is developed, encourage releasing with wrist bent back (extended) by asking the child to release into higher containers or to release stabilized objects that are positioned above wrist level.

When the child can release objects with a straight elbow, move a large container closer and closer to the body and encourage the child to release objects with a bent elbow.

Progress from voluntary release of firm medium-sized objects into containers with large openings, to firm small objects into small containers. Work on release of soft objects only when firm, small objects are released with good control.



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*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

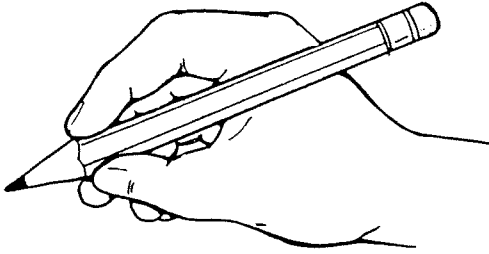
Date \_\_\_\_\_

FOREARM, HAND, AND FINGER CONTROL  
Classroom and Individual Practice

**GRASPING A WRITING IMPLEMENT**

**Purpose**

To encourage use of the most efficient form of pencil grasp



**Position**

The pencil is grasped between the tips of the thumb and the index fingers and is supported against the side of the middle finger. The last two fingers are curved and rested against the table surface. The wrist is bent back (extended) slightly, and the pencil is held about 1" from the tip (slightly more for left-handed children).

**Activities**

1. Demonstrate the correct position and assist child in placing fingers correctly. Use one of the following techniques to remind child of correct placement:
  - To provide visual and touch cues for finger placement, place a thin strip of adhesive or masking tape, a piece of string under tape, a rubber band, or a rolled-up piece of tape around the pencil, about 1" from the tip.
  - Use a triangular or Stetro® pencil gripper.
  - Paint a ring around the pencil to indicate where to hold.
  - Color code places on pencil and fingers to indicate where each finger should make contact.
2. Short crayons, pencils, or pieces of chalk encourage use of a tripod grasp.
3. Whenever the correct grasp is assumed, give praise.
4. When the desired grasp position is assumed, place paper over a textured surface (such as plastic templates, rough sandpaper, or textured objects) while child scribbles or makes large drawing movements with crayon, pencil, or marker. This will help child "get the feel" of the correct finger positioning.
5. Encourage child to use this grip position for large scribbling activities on chalkboard, mural paper on the wall, or large paper on the desk or table.
6. When desired grasp is used consistently for the activities described in 4 and 5, practice using fine finger movements of the tripod fingers for tracing, outlining, and coloring in small areas in pictures or coloring books, using any of the methods listed above to assist with maintaining finger positioning.

7. If finger movements are awkward, provide other activities to develop finger control.
8. Provide regular, supervised practice periods until the correct grip position is used automatically. If an abnormal grip pattern becomes a habit, it is much more difficult (often impossible) to change later. Grips are easier to change early—in kindergarten, first, and second grades. However, if awkward grip interferes significantly with writing speed or legibility in later grades, attempt to improve it. This should be carried out gradually over a long time, with daily practice periods.

**Desired Response**

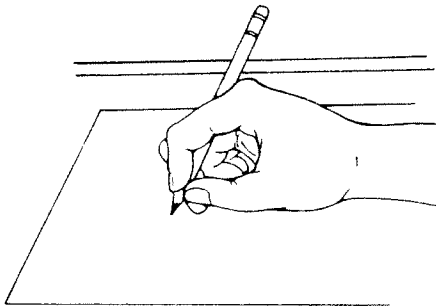
Child maintains the dynamic tripod grasp position, with wrist extended slightly.

**Undesired Responses**

Child's grip changes during activity so that the space between the thumb and index finger (web space) is closed; all fingers move during writing; or another abnormal grip pattern is assumed. Child grasps pencil with bent wrist.

**Variations and Adaptations**

If child bends wrist forward (flexes), encourage activities that involve drawing and writing above eye level, on the chalkboard, easel, or large paper taped on the wall.



Some children with weak hands or tremor (shakiness) may not be able to use the dynamic tripod grip effectively. Benbow (1990) recommends a more stable position for children with loose finger joints. The positioning is the same as for the dynamic tripod, except that the pencil shaft is placed between the index and middle fingers for increased stability.

**References**

Benbow, M. D. 1990. *Loops and other groups: A kinesthetic writing system*. Tucson, AZ: Therapy Skill Builders.

Stetro® is a registered trademark of Rusko Writing Co., Inc.

*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**  
**FINGER AWARENESS AND ISOLATION**

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**Purpose**

To increase the child's awareness of hands and fingers and their movement possibilities

**Preparation**

If child avoids touch, prepare the hands for this kind of activity with techniques designed to increase tactile contact.

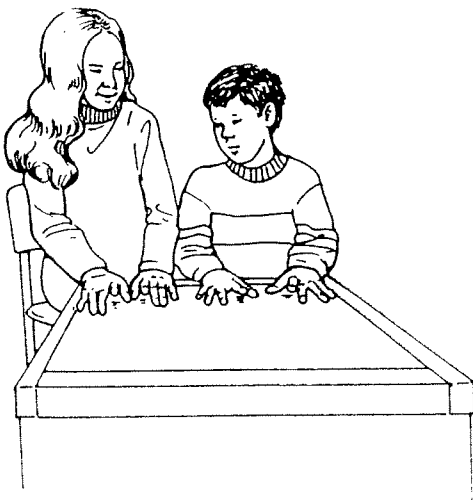
**Activities**

Any activity that promotes sensory stimulation and movement of the fingers alone and in various combinations will help to increase awareness and differentiate movement of the fingers.

1. Lotion. Child applies hand lotion and spreads it on individual fingers and on combinations of fingers.
2. Finger painting. Child paints with fingers in finger paint, shaving cream, or foam. Child applies different colors to each finger and paints on paper with individual fingers or all together. Child "rakes" through paint, cream, or foam with each fingertip in sequence, or paints with each finger one at a time.
3. Finger games. Child plays "Where Is Thumbkin?" and other finger-play songs and clapping games.
4. Finger puppets. Child places one puppet on each finger and straightens and wiggles each as the puppet character "talks"; or uses one puppet on each index finger while holding other fingers still.
5. Fingertip games. Draw faces or place stickers and stars on pad of each finger. Child straightens each finger to see what is on it; wiggles fingers to make each face "talk" to the face on the thumb; touches each fingertip to the thumb tip to make stickers or faces "kiss"; or wiggles specific stars on request ("Show me the red star . . . Now show me the blue one").
6. Resistive materials. Child pokes individual fingers into dough, putty, or clay; makes a texture by repeatedly poking the material with an index fingertip; pulls up "hills" with the fingers; and squeezes dough through the fingers.



7. Touching with index finger. Place different-textured materials, liquids, and objects in bottles with small openings or in sections of an egg carton. Encourage child to put an index finger inside the bottle (the other fingers won't fit in) to feel the contents.
8. Doorbells, push-button toys, rotary phone dial. Child manipulates objects that require use of one finger at a time.
9. Small objects. Child picks up beans, raisins, or pegs between the tips of the thumb and each finger, one at a time, and places them in a small container.
10. Musical instruments. Child plays instruments that require movements of individual fingers, such as recorder, piano, or flute.
11. Keyboards. Child uses calculator, computer, or typewriter keyboards with index fingers of both hands or with movements of individual fingers.
12. Imitation games. Child plays "Simon Says" games that focus on hand and finger movements, such as:
  - Making circles by touching each fingertip to the tip of the thumb.
  - Moving thumbs up and down, wiggling thumbs, and moving them in a circle.
  - Opening and closing hands.
  - Spreading fingers apart and pulling them back together very tightly.
  - Bending all fingers at the knuckles.
  - Wiggling each finger by itself.
13. Putting hands in a box of foam packing "peanuts," sand, or macaroni, and opening and closing hands or moving individual fingers without looking. Child pulls hand out to check if the fingers are in the desired position. Child picks up the material and spreads fingers apart to let it fall through.
14. Finger-sequence games. Child copies adult (or another child) by raising and lowering individual fingers in the sequence demonstrated.
15. Rubber-band games. Child places a rubber band around straight fingers; stretches fingers out and pulls them back in to make larger and smaller circles with the rubber band. Child stretches rubber bands between various combinations of straight fingers.
16. Tape. Child places masking tape (sticky side out) around individual fingers or groups of fingers, and picks up colored salt, dry peas, or small scraps of paper. Child makes fingers stick to each other, then pulls them apart.



**Desired Response**

Child focuses on the sensory stimulation of the fingers and moves them individually and in various combinations.

**Undesired Response**

Child uses large and undifferentiated arm and hand movements.

**Variations and Adaptations**

If the child is unable to move the index finger apart from the other fingers, hold the other fingers down gently during activities that require isolated use of the index finger (for example, poking small items, pushing buttons or piano keys). Decrease your support gradually.

Give child a medium-sized object to hold with the thumb and last three fingers while using the index finger alone.

*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**  
**FINE FINGER CONTROL**

**Purpose**

To increase control of precise movements of the fingers

**Preparation**

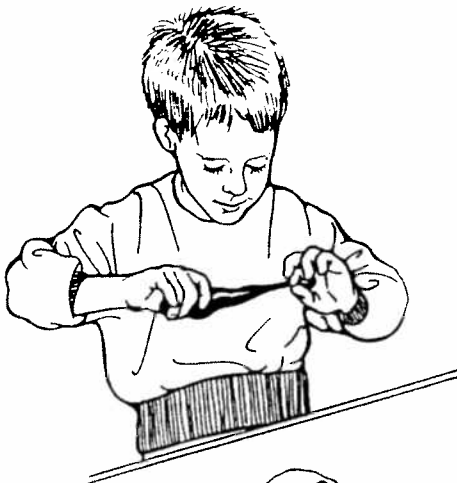
If child's hands are stiff (with high tone) or floppy (with low tone), provide a few minutes of activities to normalize tone before beginning work on fine control. Encourage activities that increase awareness and isolated movement of the fingers before or together with fine finger control activities.

**Activities**

Any activity that promotes use of the fingers in a highly skilled and precise manner is helpful. Provide opportunities for practice of the following kinds of activities, as much as possible throughout the day.

*To encourage use of the skilled side of the hand (thumb side) while holding the last two fingers still:*

1. Child picks up small objects (pegs, beans, raisins) between the tips of the thumb and index finger, one at a time, and places them in a small container.
2. Child picks up small objects with tweezers, using the index finger and thumb.
3. Child removes objects from a container with a small opening, using thumb and index fingers. (The other fingers won't fit inside the container.)
4. Child pulls small pieces of dough, clay, or putty with the thumb and index finger (or thumb, index, and middle fingers) and rolls them into little balls, using finger movements. Child makes a "bird's nest" by pinching a larger ball into a nest shape and filling it with "eggs."
5. During any fine motor activity, present objects directly to the fingers on the thumb side of child's hand.
6. Child practices cutting with scissors while touching the pads of the last two fingers to the palm.
7. Encourage child to hold an object against the palm with the last two fingers during activities such as those described above.



Eggs in a nest

*To promote use of the skilled side of the hand while grasping with the fingers of the stabilizing side:*

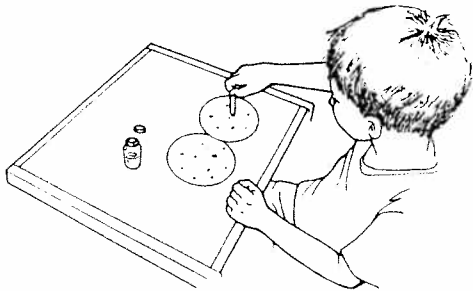
1. Child holds marker or pen with the last two fingers while removing the cap and replacing it, using the thumb, index, and middle fingers.
2. Child squirts squirt gun at targets.
3. Child holds a small jar while loosening the top with the fingers of the same hand, and holds the top with fingers while removing items from the jar with the other hand.
4. Child uses spray bottles to spray water on plants, wash windows, hit targets, or spray different colors of colored water to make a design.
5. Child picks up objects one at a time with the first three fingers, and holds them with the last fingers against the palm while picking up more. Reversing the actions, child replaces objects one at a time. Magnetic marbles provide slight resistance to finger movements, enabling children to feel movements more easily and develop finger strength.
6. Child removes coins from a small purse one at a time, using the fingers, and holds the coins in the same hand.

*To develop use of fingers for object rotation (Note: Do not allow child to use palm, other hand, chest, or table surface for turning objects):*

1. Child uses fingers of one hand to pick up pencil, crayon, or marker and turn it around into the correct position for writing. Child uses fingers of one hand to remove crayon from box and orient it for use.
2. Child picks up pegs, puzzle pieces, construction-set pieces, and other small objects. Child turns them with the fingers to position for use.
3. Draw a face or place a sticker or star on one side of a wooden cube. Child holds block between tips of thumb and first two fingers and uses finger movements only to turn it so that the star returns to the top. Child works on increasing speed and smooth movement.
4. Child makes small balls with clay, dough, or silly putty; "walks" the balls across the table surface and up and down walls, using finger movements only.
5. Child screws nuts on and off bolts.
6. Child twists wire twist-ties on and off bread bags or garbage bags. Child twists pipe cleaners to create various shapes.
7. Child spins tops.
8. Child turns knobs to operate radio and television.

To encourage fine movements of thumb, index, and middle fingers:

1. Child traces around and colors in small areas in drawings or coloring books. Encourage small bending and straightening movements of the thumb joint and the joints of the index and middle fingers while holding the hand, knuckles, and last two fingers still. Hold child's hand still, if needed.
2. Child draws small circles using the finger movements described above. Draw a  $\frac{3}{4}$ " circle and ask child to draw one inside, then another one inside of that, and so on; or ask child to color in an area of a picture or design, using tiny circles.
3. Child practices buttoning and pre-buttoning activities, such as handling coins for placement into food dispensing machines; placing chips into a coffee can with a slit in the lid; and unbuttoning and buttoning larger buttons, then smaller ones.
4. Child turns pages of a book and separates or picks up pieces of paper. Have child begin with thick pages or paper; decrease thickness as skill improves.
5. Child uses small eyedropper to drop water on target stars or to drop colored water drops to make a design. Encourage child to control pressure to squeeze out one drop at a time.



#### Desired Response

Child uses precise movements of the fingers for these activities.

#### Undesired Responses

Child uses large and undifferentiated arm and hand movements, or uses both hands to manipulate objects. Child holds or moves objects against table surface or chest instead of using the fingers and hand for stabilization and manipulation.

#### Variations and Adaptations

If child uses movements of the arm or wrist instead of finger movement, hold child's wrist to require finger movement.

If child uses the other hand to manipulate objects held in the dominant hand (to avoid finger movement), hold child's nondominant hand (or encourage the child to sit on it).

If child uses the whole hand instead of holding the last fingers still while using the thumb, index, and middle fingers, encourage weight bearing on the ulnar (little-finger) side of the palm for a few minutes before the activity, and gently hold child's last fingers against the palm during the activity.

During all fine-motor activity in the classroom or at home, remind the child to use fingers for manipulating objects. Hold child's wrist or forearm to encourage this, if needed.

*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

FOREARM, HAND, AND FINGER CONTROL  
Classroom and Individual Practice

**FINE FINGER MOVEMENT FOR WRITING—  
WARM-UP EXERCISES**

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**Purpose**

To improve the child's use of fine finger movements for writing

For most children, these skills develop at around five or six years of age, so these activities are not recommended for children below that age.

**Preparation**

If stiffness, low tone, or joint stability is a problem, spend a few minutes working on this before beginning any writing activity.

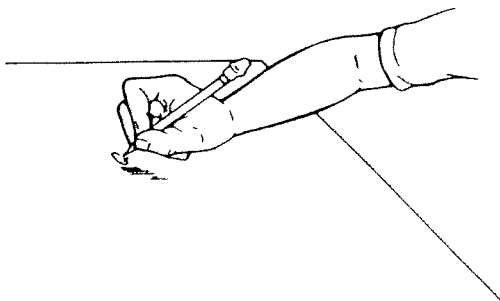
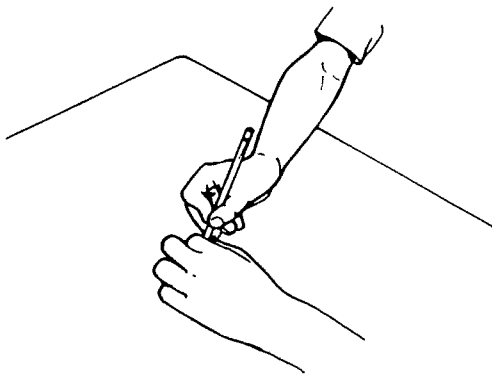
**Position**

Child sits with feet resting on the floor and arms supported on desk of proper height. The ulnar side of the hand (little-finger side) rests on the desk surface. The wrist is bent back slightly; and the thumb, index, and long fingers are holding a pencil in a tripod grip, with the ring and little fingers bent and providing support for the tripod.

**Procedure**

These activities help to stimulate stability of the finger joints and provide a reminder of the desired movements for writing. They can be used briefly to warm up for any writing activity.

1. Child holds the pencil in the desired grip pattern; adult grasps the writing end of the pencil. Adult pushes and pulls away from and towards the fingers with rapidly changing small movements. Child holds the pencil steady against the push-and-pull movements without movement of the fingers, knuckles, or wrist. Exercise is repeated several times.
2. With the pencil positioned an inch or so above the writing surface, child straightens and bends the joints of the tripod fingers in the movement used to draw straight lines. Exercise is repeated several times until bending and straightening of finger joints causes pencil to make smooth lines in the air.
3. When the movements described above are accomplished in a smooth and rhythmic manner, child makes circular (rotary) movements with the pencil in the air as though drawing small circles.



4. When the steps described above are performed easily, rhythmically, and with smooth movement, child begins the writing activity, using the same grip and finger movements.

**Desired Response**

Child stabilizes all joints against slight resistance in the desired grip position during the first exercise, and uses movement of the joints of the tripod fingers to move the pencil in straight-line and circular movement patterns.

**Undesired Responses**

Movement occurs at upper arm, forearm, wrist, or the last two fingers; the hand rests on the palmar surface; or the wrist is bent forward (flexed) during any of these exercises.

**Variations and Adaptations**

These warm-ups can be done with the tripod fingers in the air, without a pencil.

Some children develop a grip using the first four fingers instead of a tripod. If child is resistant to using a tripod grip, have child perform these activities with movement at the joints of the four fingers, being sure that the little finger is stabilizing and the web space between the thumb and index fingers is open and rounded.

Grippers are commercially available that assist child in maintaining the desired tripod position.

*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**

**OBJECT ROTATION WITH FINGERS—**  
**PENCIL PRACTICE**

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**Purpose**

To improve isolation and sequencing of fine finger movements for rotating objects within the fingers

**Materials**

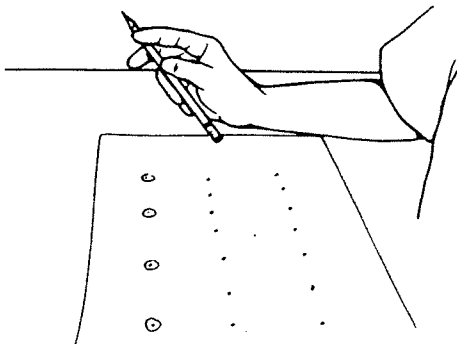
Unlined paper; pencil with an eraser; clock or stopwatch

**Preparation**

Draw three horizontal rows of light dots about 1" apart across the paper.

**Position**

Child sits at a desk or table in stable position. The forearm rests on the table, and the pencil is grasped in writing position.



**Procedure**

Child makes a small circle around the first dot, turns pencil over to erase the second dot, and continues to rotate the pencil to circle and erase alternate dots across the first row. Adult records time as child repeats with the second row of dots. Child tries to exceed previous time on the third row.

**Desired Response**

Child uses sequenced movements of the fingers to rotate the pencil within the hand for writing and erasing.

**Undesired Responses**

Child uses the other hand to move the pencil; puts it down to rotate it against the table top; or rotates it against palm or chest. Child moves the forearm or wrist to position the pencil for erasing.

**Variations and Adaptations**

If child uses arm and wrist movements to rotate the pencil, hold the wrist firmly to inhibit movement (or encourage child to do so).

Reinforce this skill in the classroom during erasing activities.

Practice object rotation with other activities. For example, draw a face or place a star or sticker on a small wooden cube. Child grasps the cube with fingertips and rotates it so that the face or star starts at the top, makes a full rotation, and returns to the top. Hold child's



wrist to inhibit any movement except fingers. Child completes three full rotations, keeping the block in the fingers (not the palm) and rotating it as quickly as possible. Adult records child's time and encourages smoother and faster performance.

Encourage use of fingers for rotating pegs, small construction-set pieces, and puzzle pieces, and for orienting crayons to put them in the box.

Reinforce finger use for rotating all objects during any fine motor activity by:

1. Inhibiting use of the other hand, desk top, or chest for turning small objects.
2. Reminding child to use the fingers instead of manipulating objects against the palm.

*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

FOREARM, HAND, AND FINGER CONTROL  
Classroom and Individual Practice

**FINGER CONTROL FOR WRITING LETTERS AND NUMBERS**

**Purpose**

To increase use of fine finger movements for writing

**Materials**

Pencil

**Position**

Child lies on stomach, propped on forearms, with wrist straight and hands resting on the ulnar (little-finger) side of the palm. Fingers point forward, and thumbs are on top.

**Procedure**

1. Child makes a tripod by placing the tips of the thumb and index fingers together to make a circle and leaning them against the side of the bent third finger.
2. Adult names a letter or number.
3. Child makes the letter on the floor, as small as possible, with small movements of the tips of the index finger and thumb.
4. Child repeats for all letters and numbers 1-10.
5. Child sits at a desk and grasps a pencil in tripod grip.
6. Child writes the alphabet in the air, with small pencil movements immediately above the writing surface.
7. Follow this exercise with a writing activity, encouraging the same finger movements.



**Desired Response**

During these practice activities, child uses tiny movements of the joints of the thumb and first two fingers to form letters and numbers while holding the forearm, wrist, and last two fingers still. During the actual writing activity that follows, the same finger movements are continued as the forearm moves horizontally across the page.

**Undesired Response**

Child moves arm or wrist during formation of letters or numbers in the air, or moves the arm forward and back during the writing activity.

**Variations and Adaptations**

Use this activity for practicing individual letters, and incorporate it into teaching cursive writing. It also is useful for improving motor memory of the movement sequences for letters and numbers.

Child performs warm-up activities in sitting position with tripod fingers in the air, stabilizing upper arm against trunk to prevent movement.

Child practices the same finger movements with activities that involve tracing and coloring in small areas in detailed pictures or coloring books.

During desk writing, inhibit forearm and wrist movement by gently holding child's wrist, if needed.

Encourage writing and coloring activities performed while lying on stomach or propped on forearms, to inhibit arm movement and encourage finger use.

Record the time as child writes the connected cursive alphabet, using finger movements on the table top. Encourage faster and smoother movement on successive attempts.

*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL**  
**Classroom and Individual Practice**

**ACTIVITIES TO DEVELOP PRE-SCISSOR SKILLS**

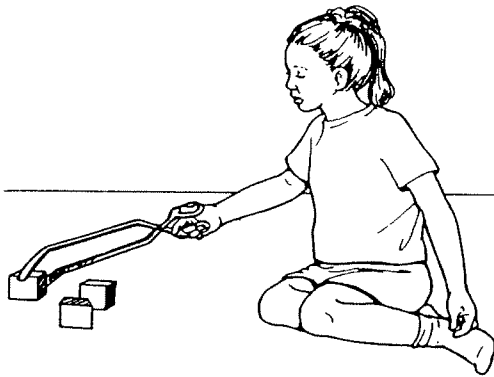
**Purpose**

To improve hand and finger skills needed for controlling scissors

**Activities**

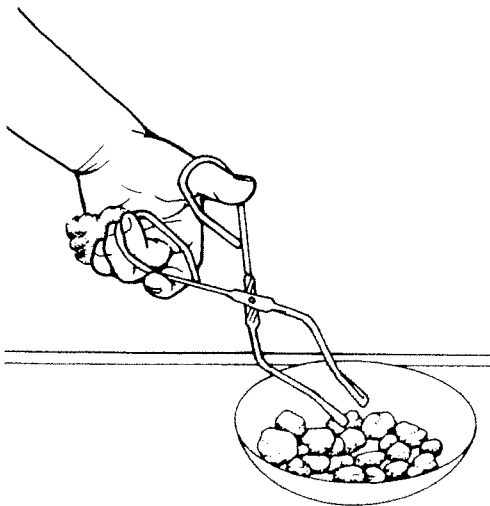
*Controlling tools with open-and-close hand movements:*

1. Child uses salad and kitchen tongs to pick up objects, move them from one place to another, and release them. This can be done as a relay race or incorporated into a game. Salad servers with scissor-like loops combine open-and-close motions with grasp of the loops for more advanced skill development.
2. Child punches holes with hand-held paper punch. Holes can be pasted on paper and made into ladybugs.
3. Child squirts water with a turkey baster or bulb syringe from one bucket to another, in the bathtub, to mix different colors of water or to aim at targets.
4. Child uses reachers to grasp and release objects.
5. Child staples with hand-held stapler.



*Using the two sides of the hand for different functions:*

1. Child uses any of the tools described above while holding the pads of the ring and little fingers against the palm.
2. Child uses any of the open-close tools while holding a small object (such as a cotton ball or piece of material) rolled up against the palm with the last two fingers.
3. Child shoots a squirt gun.
4. Child squirts water from a spray bottle.
5. Child uses a toothpaste pump to put paste on toothbrush.
6. Child makes a circle by touching pads of the index and middle fingers to the pad of the thumb while holding the last two fingers against the palm; and picks up and releases objects between the thumb and first two fingertips.



**Desired Response**

Child opens and closes hand to control tools; eventually opens and closes thumb, index, and middle fingers separately or in combinations while holding the last two fingers still or grasping with them.

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

FOREARM, HAND, AND FINGER CONTROL  
Classroom and Individual Practice

**SCISSOR CONTROL—OPENING AND CLOSING THE BLADES**

**Purpose**

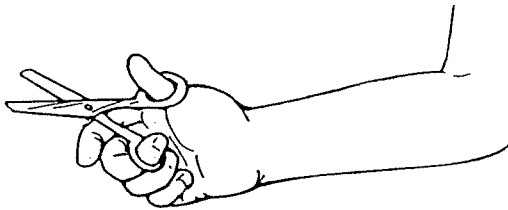
To improve control of opening and closing of scissor blades

**Materials**

Children's scissors which are appropriate for the child's hand dominance; index or playing cards; plastic or paper straws; string; hand-held hole punch

**Preparation**

Normalize muscle tone, if needed, before working on this activity. Pre-scissor skill activities are useful before or together with actual cutting practice activities, to increase the number of repetitions of the desired movements.

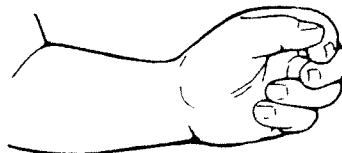


**Position**

Hand the scissors to child with one loop above the other; encourage child to grasp them with arm in mid-supination (thumbs-up) position. Child inserts thumb and middle fingers into loops so the loops rest near the middle joints. The index finger supports the lower loop, to help with closing and holding the loop steady. The scissors are held perpendicular to the floor and the wrist is straight or bent back slightly.

**Procedure**

1. (a) Child bends all fingers except the thumb so the pads touch the palm of the hand.
- (b) Child uncurls the index and middle finger partially while moving the thumb out and away from them.
- (c) Child bends index and middle fingers back toward palm slightly, and moves thumb in to rest on the side of the index finger.
- (d) Child repeats (b) and (c) until exercise is performed smoothly.



2. Child grasps scissors as described in "Position." Child uses the same motions to open and close the blades in the air until movement is smooth and rhythmic.
3. Child cuts straws into 1" pieces, string into 15" lengths, and playing or index cards into strips; grasps hole punch and punches holes in card pieces; and strings straw and card pieces to form necklace or decorative string.

### **Desired Responses**

Child holds scissors correctly and uses small movements of the thumb and middle fingers to control opening and closing of blades. The scissor loops are grasped securely, and the last two fingers are held against the palm during cutting.

### **Undesired Responses**

Child holds the scissors with loops near the knuckles, straightens or bends fingers all the way, or moves all five fingers during cutting.

### **Variations and Adaptations**

Any cutting activities can be practiced in this manner. Many older children are motivated to control their cutting movements when cutting items of interest from magazines to make a scrapbook or collage.

If child has difficulty inhibiting movement of the last two fingers, encourage leaning on the ulnar (little-finger) side of the hand on the desk top or floor, in weight-bearing positions, before cutting activities.

Cutting while lying on the floor, propped on forearms, is also good for inhibiting movement of the last two fingers, and for stabilizing the arm in a thumbs-up (supinated) position.

Encourage child to hold a small object against the palm with the last two fingers, to practice keeping them still during cutting.

If child is unable to control open-and-close motions while holding the loops, place your hand over child's hand to assist with this motion; or use double-loop scissors that allow you to control this movement as child develops "the feel" of it.

Encourage child to use small, controlled snips and to hold the last two fingers still during all cutting activities.

If child has difficulty controlling small snips, wrap yarn or tape around the loops so the blades don't close all the way; or wrap a rubber band around the intersection of the blades to keep snips small.

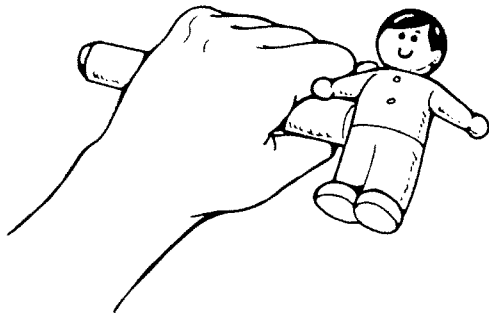
*Use of these activities should be directed by a qualified therapist.*

Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL  
Compensatory Strategies**

**OPENING AND CLOSING THE HAND**

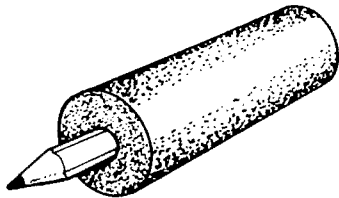


**Purpose**

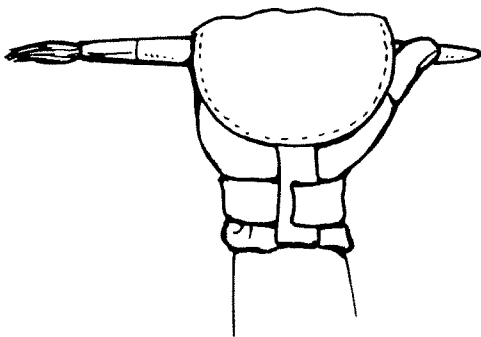
To modify activities and classroom materials for the child who is unable to open and close the hand in a controlled manner

**Modifications**

1. If child is unable to open a fisted hand to grasp, relax the hand and insert objects into it with the fingers on one side and the thumb on the other side. Attach cylindrical handles to toys so they can be held this way.
2. Build up handles of utensils to make grasping easier. Firm handles can help to decrease the tension in the grasping fingers; but if tension is not a problem, handles can be built up with tape or cylindrical foam padding. (Foam curlers work well.) A number of types of built-up utensils are available from medical supply companies.
3. If child is unable to keep the hand closed to hold objects, try holding your hand over child's hand to maintain grasp during activity.



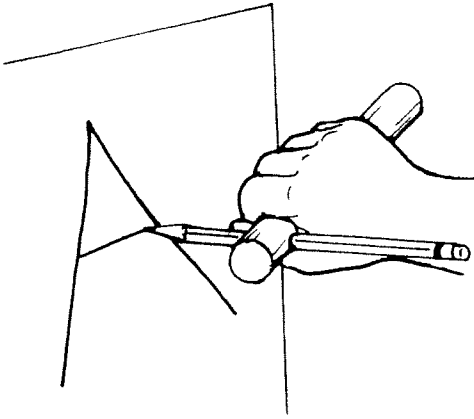
Adaptive equipment is designed to hold objects without grasp. A few examples are a Universal Cuff, which holds writing or eating utensils; a Klick pencil holder, which holds a writing implement without grasp; or a Grip-Mate, which holds a variety of utensils at several angles.



Purchase or make a mitt for holding the hand in a grasping position. Holding mitts are made like mittens with the thumb not enclosed, and with a T-shaped strap that extends from the end of the mitt. When pulled down and wrapped around the wrist, the strap holds the hand closed in a grasping position with objects held inside.

Some toys or manipulatives can be strapped to a child's hand. For example, a sponge can be strapped to the hand, dipped into a tin of paint, and rubbed over the top of a stencil to create a picture in art class.

Wrap a bandage or piece of sock around the child's palm, with fingers exposed. Attach Velcro® to the material and to toys or objects to enable the child to pick them up and move them.



4. For children who are able to maintain only a horizontal, whole-hand grip, modify writing implements for use in that position. For example, tape together two crayons in a T shape; child holds the horizontal one for drawing. Insert a pencil through a hole in a large dowel; child grasps the dowel.
5. If child is unable to open and close scissors, mount flexible-loop scissors on a block of wood so that arm movements can be used for closing the blades, which open automatically; or provide electric scissors.
6. Adapt activities so that manipulative materials can be moved by pushing across the desk surface without requiring child to grasp and lift.
7. If child is unable to release objects, bend child's wrist forward slightly and rub the back of the hand to encourage the fingers to open. It sometimes helps for child to remove the object with the other hand or to rub it against a surface.

#### **Comments**

These suggestions may maximize a child's ability to participate in classroom activities independently. However, more coordinated movement patterns will not develop unless child also is encouraged to engage in activities that improve hand function. Do not use compensatory strategies exclusively unless it has been determined that coordination will not improve to a functional level with practice, so compensation becomes the top priority.

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*Use of these activities should be directed by a qualified therapist.*



Child's Name \_\_\_\_\_

Date \_\_\_\_\_

**FOREARM, HAND, AND FINGER CONTROL  
Compensatory Strategies**

**FINE FINGER CONTROL**

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**Purpose**

To maximize the child's ability to perform fine motor activities despite difficulty with control of fine finger movements

**Modifications**

With weak control of fine movements of the fingers, a child will use larger, less precise, slower, and more tiring movements of the hands and arms for fine motor activities. Understanding that this is a physical weakness rather than a behavioral problem (slow, lazy, or sloppy) can help us to provide the extra support needed to protect the child's self-esteem and motivation for school work. Consider ways to modify the activity to minimize demands for small movements of individual fingers or coordinated movements of the finger joints.

1. Larger crayons, primary-size pencils, and thick markers are often easier to grasp and manipulate using larger muscle groups.
2. The amount of space between lines on writing paper should be determined by the child's optimal size for controlling finger movement. A child who uses arm or hand movement instead of finger movement for writing will benefit from larger spaces to write in. Ask the child to write a sentence (word, name) in his or her very best writing on a single line to see what size is most comfortable. Then choose paper with lines that allow that size. Often a child who consistently writes outside of the lines could perform better with larger spaces between the lines. Adapt worksheets to provide larger spaces or boxes for writing answers.
3. Writing or drawing on a chalkboard or other upright surface eliminates most wrist and finger movement.
4. Change your classroom expectations for handwriting speed, endurance, and neat appearance. Writing with larger arm and hand movements is slower, more fatiguing, and not as finely controlled in terms of pressure or accuracy of letter formation. Allow extra time for writing assignments, with regular rest periods, and focus on legibility rather than neat appearance.
5. Provide flexible-loop scissors that have only one plastic loop and require only simple open-and-close hand motions for cutting.

6. If child is able to open and close scissors but has difficulty using small, controlled snips, wrap yarn or tape around the loops so the blades cannot close all the way. This should help the child to achieve smaller, more continuous snipping.
7. Provide larger manipulatives (blocks, pegs, construction toys) and build up longer levers or add knobs to allow for larger movement.
8. If child has difficulty isolating one finger at a time for pressing keys on a typewriter or computer keyboard, provide a keyboard guard, a device that is placed over the keyboard and has holes for the fingers to be pressed through so that less accuracy is required; or make a mitt from a sock with a hole in it, to isolate the index finger for pressing keys.
9. For some children, it is difficult to use individual fingers quickly or with controlled pressure, resulting in letters being repeated as fingers press the keys for too long a time. Contact the computer manufacturer to obtain information on how to disable the repeat function.
10. If child has difficulty turning pages of a book, place a paper clip on each page; or use the eraser end of a pencil or a rubber fingertip cover (available from office supply stores) to turn pages. Electric or battery-operated page turners are available, if needed.
11. If letter formation is difficult, use plastic, wooden, felt, or magnetic letters for extra practice in spelling or writing without the need to focus on fine motor skills.
12. Stamps and ink pads require less precise finger movement for making designs, drawings, and letters.
13. Larger buttons require less fine finger movement than smaller ones, and Velcro® fasteners simplify fastening even further.
14. Word processing provides a valuable alternative for expressing knowledge in written form, with simplified fine-motor demands.

### **Comments**

These suggestions may improve classroom fine-motor performance. However, less efficient movement patterns may be strengthened unless child also is encouraged to engage in activities that improve finger coordination. Do not use compensatory strategies exclusively unless it has been determined that finger coordination will not improve to a functional level with practice, making compensation the top priority.

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*Use of these suggestions should be directed by a qualified therapist.*