

Physical anatomical development through woodwork



General Physical Development:

Woodwork provides many opportunities for physical development as children learn to handle tools safely and with increasing control.

Woodwork helps children to:

- Develop hand-eye coordination
- develop coordination
- Learn to handle tools safely with increasing control
- Refine balance to develop the poise and stance
- Develop agility and dexterity, manipulative skills, and muscular strength
- Develop fine manipulative motor skills

- Develop gross motor skills
- Develop rich range of movements
- Develop precision and accuracy
- Develop their core strength
- Develop muscle tone, appropriate tension and balance
- Develop sensory awareness
- Develop spatial awareness and associated positional language
- Develop understanding of physical space and needs of others
- Use a range of small and large equipment/tools

Self-care

- become aware of dangers, hazards and safety issues
- begin to understand how important it is to lift, carry, place and use equipment safely.
- Develop awareness for the need of the safety of others



Hand-eye coordination is intrinsic to woodwork and children gain increasing control over their bodies as they develop agility and dexterity, manipulative skills, and muscular strength. They refine their balance as they develop the poise and stance required to operate the tools in the most effective way. Proprioception and kinaesthesia are also developed with the children's increasing ability to sense position and develop awareness of motion. Lower arm, wrist and hand control are all developed. This manual dexterity is beneficial in so many ways, for example learning to use cutlery, kitchen utensils, scissors or supporting early mark-making with pens and paint brushes.

Woodwork incorporates fine motor skills (holding a nail, screwing) and gross motor skills (hammering, sawing). There are many different types of movement such as pushing/ pulling (saw, file) and rotating (screwdriver, drill, wrench, vice) and levering (claw hammer, Japanese nail puller) and rubbing (sandpaper). Hand-eye coordination is developed for example whilst hammering or threading a nut on a bolt. One handed tools (screwdriver, wrench) and two handed tools (hand drill) are experienced. Using tools develops children's spatial awareness and associated positional language.

Woodwork encourages precision, for example when keeping a nail upright or cutting along a desired line. It also requires using a variety of degrees of force, for example, gentle initial hammering, then more robust hammering to drive the nail into the wood. With sawing, children will refine their action to get just the right pressure to get a smooth and steady cut.



As children become more familiar with the tools they become more adept, adjusting their position and stance to use their muscles more effectively. They learn to adjust their posture when sawing, positioning the left leg forward and the right leg back to be more efficient, enhancing their control and strength (vice versa for left handed children).

Children's core strength is developed as they use the various tools, such as hammering, rotating the screwdriver or sawing. The delight on a child's face when they have persevered cutting through a section of wood is a wonder to behold: a real mixture of pride and surprise that they could actually make it happen.

Children develop their awareness of the effect of their physical presence on others through understanding the need to work at a safe distance from each other. They also learn how transport tools safely, walk with tools, carry them at their side and not pass them with sharp edges facing forward.

Woodwork also helps develop children's senses as they experience the different textures of wood, the associated smells and various sounds that come from the woodworking area.

Woodwork is a kinaesthetic experience that embeds a deep memory as the whole body learns together. Experience of using tools becomes part of children's physical vocabulary.



Proprioception:

Proprioceptive sensation is integral to developing motor control when learning new skills.

Proprioception is defined as the perception of stimuli relating to position, posture, equilibrium, or internal condition. Basically this means knowing where your body is in relation to the external environment, for example, being able to sit in a chair without turning round to look, or walk up stairs.

Proprioception is a dynamic sense, allowing us to continuously adapt to a changing environment and is learned through all our other senses and neuro-developmental exercises, usually whilst we are children

Kinaesthesia: This related term is awareness of the position and movement of the parts of the body by means of sensory organs (proprioceptors) in the muscles and joints.

Vestibular sense:

The vestibular sense is so named because it is sensed in the 'vestibulum' system in the inner ear in the semi-circular canals. These are responsible for balance, and it describes both the sense of balance and spatial orientation. The vestibular system detects movement and changes in the position of the head, for example, when your head is upright or tilted (even with your eyes closed).

It is vital to know about these, because without good vestibular and proprioception senses, children would not be able to walk, hop, skip, navigate around a room, catch a ball and definitely not be able to manage stairs.

Luckily developing both these senses can be achieved through some very simple activities.

Both senses can be developed through woodwork, using the tools and taking calculated risks. Also Experiencing heavy/ light materials

The vestibular sense can be developed through:

Movement – Large body (gross motor skills) sawing, filing, sanding

Balance – posture at the workbench

Proprioception can be developed by:

Hammering, Sanding, Sawing, Screwing, filing, drilling, pushing/pulling, fine manipulation

(This section includes content from Kathy Brodie <https://www.kathybrodie.com/>)

Hand – Wrist – Elbow - Shoulder – Core body are all developed through woodwork

So many aspects of anatomical movement are incorporated: When we look closely it is extraordinary just how many of these are encompassed within woodwork as children for example:



- hold a nail
- hammer
- screw
- drill
- file
- saw
- use a brace and bit
- Use a bradawl
- use sandpaper
- lever nails out

Flexion and Extension

Flexion and extension are movements that occur in the sagittal plane. They refer to increasing and decreasing the angle between two body parts:

Abduction and Adduction

Abduction and adduction are two terms that are used to describe movements towards or away from the midline of the body.

Abduction is a movement away from the midline – just as abducting someone is to take them away. For example, abduction of the shoulder raises the arms out to the sides of the body.

Adduction is a movement towards the midline.

In fingers and toes, the midline used is not the midline of the body, but of the hand and foot respectively. Therefore, abducting the fingers spreads them out.

Medial and Lateral Rotation

Medial and lateral rotation describe movement of the limbs around their long axis:

Medial rotation is a rotational movement towards the midline. It is sometimes referred to as internal rotation.

Lateral rotation is a rotating movement away from the midline. This is in the opposite direction to the movements described above.

Elevation and Depression

Elevation refers to movement in a superior direction, depression refers to movement in an inferior direction.

Pronation and Supination

This is easily confused with medial and lateral rotation, but the difference is subtle. With your hand resting on a table in front of you, and keeping your shoulder and elbow still, turn your hand onto its back, palm up. This is the supine position, and so this movement is supination.

These terms also apply to the whole body – when lying flat on the back, the body is supine. When lying flat on the front, the body is prone.

Opposition and Reposition

A pair of movements that are limited to humans and some great apes, these terms apply to the additional movements that the hand and thumb can perform in these species.

Opposition brings the thumb and little finger together.

Reposition is a movement that moves the thumb and the little finger away from each other, effectively reversing opposition.

Circumduction

Circumduction can be defined as a conical movement of a limb extending from the joint at which the movement is controlled.

It is sometimes talked about as a circular motion, but is more accurately conical due to the 'cone' formed by the moving limb.

HAND

The hand in the human body is made up of the wrist, palm, and fingers. The most flexible part of the human skeleton

Biomechanics:

Fingers/ Knuckle

Flexion: Moving the base of the finger towards the palm.

Extension: Moving the base of the fingers away from the palm.

Adduction: Moving the fingers toward the middle finger.

Abduction: Moving the fingers away from the middle finger.

Flexion: Moving the last two segments of the finger towards the base of the fingers.

Extension: Moving the last two segments of the finger away from the base of the fingers.

Wrist

Flexion: Moving the palm of the hand towards the front of the forearm.

Extension: Moving the back of the hand towards the back of the forearm.

Adduction: Moving the small finger side of the hand toward the outer aspect of the forearm.

Abduction: Moving the thumb side of the hand toward the inner aspect of the forearm.

Thumb

Abduction: Moving the bone below the thumb towards the palm of the hand.

Extension: Moving the bone below the thumb away from the hand.

Adduction: Moving the bone below the thumb towards the back of the wrist.

Abduction: Moving the bone below the thumb towards the front of the wrist.

Opposition: Moving the thumb across the palm of the hand touching the other fingers.

and

Flexion: Moving the joint at the base of the thumb towards the heel of the hand.

Extension: Moving the joint at the base of the thumb away from the heel of the hand.

Adduction: Movement of the thumb base towards the back of the hand.

Abduction: Movement of the thumb base away from the back of the hand.

and

Flexion: Bending the top of the thumb towards the base of the thumb.

Extension hyperextension: Moving the top of the thumb away from the base of the thumb.

