



*Assistive and Instructional Technology  
Supporting Learners with Disabilities*

# SELECTING AND USING SWITCHES

Republished with permission from  
The Let's Participate! Project

# SELECTING AND USING SWITCHES

## CHILD INTERESTS AND ABILITIES

Determining how and when a child can use a switch requires input from all who interact with the child throughout his/her day: the child, family members, caregivers, educators, and other relevant IFSP team members. It is in working together to determine the purpose of the switch use that “useable” technology solutions are discovered.

A child’s physical, sensory and cognitive abilities impact on the selection of the switch and where it is positioned. Look for the child’s voluntary movement, one that is consistent and that can be controlled. It can be large or small, weak or strong. His/her movement patterns should be observed. The movement should be reliable in that it can be intentionally repeated; a reflexive pattern is not a good choice. Ideally, the child should be able to initiate a movement to activate a switch and be able to sustain and/or release contact with the switch.

The abilities and positioning options of a child are matched with specific features of a switch. For example, a child with a reliable “pulling” motion may be successful using a pull-switch requiring that movement. There may be several switches used during the day as the child’s position and participatory interests change.

Switches come in all shapes and sizes. They are often used by a hand or arm, but can be used with any body part. A child should be able to voluntarily activate the switch with large or small movements. Our experience indicates that young children most frequently use a 2.5 to 5” push switch. If the child is able to use his fingers or hands, start with these as their interaction with a switch and the resulting response will all be within a contained visual field. However, since switches are designed to work with any body part, look for the movement that requires the least expenditure of energy and the one the child prefers.

## SWITCH CHARACTERISTICS

There are several ways to examine a switch to determine its usefulness for an individual child. Knowing the child’s abilities and preferences will help to find a “match”.

- ❖ The **size** of the surface “target” that a child must activate is a primary characteristic; how large does the surface have to be? how small might it be? Examine which areas actually activate the switch? the center? the corners? the edges?
- ❖ The amount of **force** (pressure) required to activate a switch must be considered; how sensitive is the switch? Although a switch may be positioned in such a way that gravity can add to the force exerted, switch closure will depend on the amount of consistent exertion by the user. Switches are often described by the amount of force/pressure required for activation.



- ❖ Another consideration is the amount of **travel** that a switch has; the distance that a switch must be moved before it activates. Keep in mind however, that some switches are designed with more “play” than others; their material may be more flexible.
- ❖ **Feedback** can be tactile and/or auditory. Many switches make an auditory “click” when activated. This may be necessary for children with visual impairments. Other types of switch feedback include vibration or musical sound so that the user knows that a switch has been activated.
- ❖ The **durability** of a switch is another important feature as some children may not be able to control the amount of pressure they use to activate a switch.
- ❖ What does the switch feel like? Does the child prefer a particular **texture**? Can it be added to the surface later?
- ❖ Many switches are available that can be controlled by any sensitivity of contact, voice/sound or minimal movement. It is important to let a child try a variety of switches at different parts of the day; s/he will let you know which one is preferred.

## SWITCH CATEGORIES

### PUSH/TOUCH SWITCH



The push (or touch) switch is the most common type, as the child activates the switch by pushing against the surface of the switch. Push switches are available in a wide range of sizes and shapes, in the type of feedback and in the amount of force a child must use.

### LEVER/WOBBLE SWITCHES



Lever switches can be activated by pushing in more than one direction. The leaf and wobble switches are examples of this type of switch. Pushing against or bending the flexible tip in any direction operates these switches. Often mounted near the hands or face/head, they are less rigid than other switches and can be easily mounted.

### WIRELESS SWITCHES



Wireless switches consist of two parts—a transmitter and a receiver. Plug the receiver into the toy/device and turn the switch on. Many wireless switches have several modes (latch, timers, etc.). These are most useful for toys that move and for children who benefit from an unattached switch.

## OTHER MOVEMENT SWITCHES



If a child is unable to make a reliable pushing movement, other switches are designed for different motoric movements. Examples of these are the pull switch, the grasp or grip switch, the pinch switch and the tongue switch. These motor-specific switches are designed for users with focused abilities.

### Shown are:

- a chain switch where a child can make any movement that causes the chains to move against the metal bar.
- a string switch is pulled to turn a toy on; consider attaching a toy or koosh ball to make its target easier to see and pull.

## ACTIVITY SWITCH



Switch closure can also be the result of a separate activity with the toy/device turning on when a separate task is completed. In the photo, when the puzzle is completed, switch closure occurs and the toy that it is connected to turns on.

## USING A SWITCH

### Positioning Options

For optimal switch play, several things must be considered:

1. The child should be in a comfortable position. Wherever the child is positioned, in a chair, at a table, or on the floor, the child should be in a comfortable, secure so that s/he can expend energy on participation. The child should not be putting effort into balancing or maintaining a particular position.
2. The switch should be placed near the child's easiest, most reliable access site. Reflexive or abnormal movement patterns should not be considered as appropriate sites. Switch placement should not interfere with stable body positioning.
3. The toy/device that the child is activating should be placed in close proximity to the switch itself. The closer the switch is to the reacting toy/device, the more concrete the relationship is.

Thus, the placement of the switch and target within a visual field is recommended, if at all possible.

4. The switch should be secured in a stable position so that it doesn't move out of place when it is activated. Special switch holders are available or items such as suction cups, Dycem (a non-slip material) or a combination of veltex fabric (loop Velcro) with hook Velcro adhered to the switch, will stabilize the switch.
  - There are several mounting systems available for switch securement and placement. These can include a combination of clamps, mounts, mounting plates, rods and flexible arms. Pieces are sold separately or as systems or kits.
  - Switches can need to be further customized in order to make them more appealing or functional to the user, by adding color stickers or textures to them.

As children should be repositioned frequently throughout the day, there can be more than one switch access site, mounting system, and/or switch that will be chosen for different activities in different positions. The stamina of the child, the environments and activity requirements will help to identify the most successful solutions.

## SWITCH INTERFACES

A switch interface is a device that is attached between the switch and the toy/device you want to control. There are several switch interfaces available to enhance and extend switch use.



- ❖ A **battery adapter** is an interface that transforms any battery operated toy or device for one with switch activation.
- ❖ The **Environmental Control Unit (ECU)** is an example of an interface for any electrical appliance with a plug. The unit is plugged into an electrical outlet; the appliance and switch are then both plugged into the unit. The switch turns the appliance on and off.
- ❖ **Switch Latch** is an interface used between the switch and the target device. One touch of the switch turns the device on. The device stays on until the switch is activated again. This is often used for prolonged activities, such as listening to music or TV.
- ❖ **Timer** is an interface used between the switch and a toy, game or other device. The device will run for a set amount of time (from 1 to 60 seconds) after the switch is activated. The device stops after the pre-set time is reached (even if the switch is held on); the switch must be re-activated for the device to run.
- ❖ **Switch Latch-Timer** is an interface that offers both features: timer and latch.

- ❖ **Series Adapter** is an interface used between a device and two switches. Both switches must be activated in order for the device to turn on. This is often used for cooperative activities, where two children must activate their switches at the same time.
- ❖ **Jack Adapter** is used to convert the size of the switch jack to match the size on the toy or interface.

**Other resources:**

**AT Partners, Tech for Tykes** [http://www.techfortykes.org/files/Switch\\_Spreadsheet.pdf](http://www.techfortykes.org/files/Switch_Spreadsheet.pdf)

Let's Participate!  
1825 Connecticut Ave., NW  
Washington, DC 20009  
[letsparticipate@fhi360.org](mailto:letsparticipate@fhi360.org)

