

technology

Inputs, processes and outputs

Lesson at a glance

Open with toaster, tablet and automatic-door pictures and ask what they share. Model IPO live on the board with a toaster, then groups map one assigned device card and sketch three boxes. The class sorts six automatic-door cards into Input-Process-Output on the flow-builder interactive, debates what counts as an input, and acts devices as human machines. Pupils finish a labelled IPO map in the Investigation Journal before a close on how technologists use the pattern.

Learning objectives

- Map an everyday device as inputs, processes and outputs
- Act out a simple human machine that shows IPO clearly to the class

Before the bell – prep

Print device cards so every group gets exactly one (even mix of toaster, tablet, automatic door – jigsaw, not a full set per table). Scrap paper or mini whiteboards for three-box sketches. Load the flow-builder interactive (explore, layout: ipo) on the IWB.

Materials

Item	Qty	Per	Source	Low-cost substitute
device cards (toaster, tablet, automatic door)	1	group	classroom	write one device name per scrap paper slip and read that card's text aloud from the lesson
scrap paper or mini whiteboards	1	group	classroom	back of an unused worksheet
Investigation Journal page	1	pupil	classroom	plain A4 sheet with three boxes drawn for input, process and output

Safety watch-point

Human-machine act-outs stay on the floor — no climbing on chairs for a tall door; leave space so nobody bumps the board or furniture.



Teaching moves

- **Inputs, processes and outputs:** Draw three empty boxes live and fill them as you talk through the toaster — bread/dial/lever, heating and timing, hot toast and click. Stress the bridge: the toaster is not digital; digital systems use the same three headings with electronics or software in the middle.
- **Map one everyday device:** Give each group of 3–4 one card only. Circulate asking ‘Is that going in, happening inside, or coming out?’ If stuck, have them mime the device first, then name each beat. Aim for a 20-second headline share per device type before the board sort.
- **Build an IPO map on screen:** Drive the flow-builder in explore mode. Door groups lead call-outs; others judge Input / Process / Output. Target: sensor and button → Input; control unit and motors → Process; door opening and beep → Output. Close with: same three headings for toaster and tablet? (Yes.) Which is a digital system? (Tablet.)
- **What counts as an input?:** One prompt at a time. Draw out that electricity and user actions can both be inputs; toast is an output not the process; sound can be output (speakers) or input (microphone). End with why leaving inputs out would break design or repair.
- **Human machine: act it out:** Same groups, 1–2 minutes to role-share and rehearse. Default: three groups present (one per device); watchers name IPO only — no extra desk task. Laugh at dramatic toast pops, then check the chain is in order and the process was not skipped.
- **Draw your IPO map:** Must-finish in lesson: one labelled three-box IPO map of a device from today. Spell the three words on the board. Scan for left-to-right flow, not a jumble — every pupil needs a usable map for the exit check.



What it should show

Toaster: bread, dial, lever → heating/timing → hot toast and click (kitchen machine, not digital). Tablet: taps/swipes/power → software/processor → screen and sound (digital). Door: sensor or button → control unit and motors → door opens (and optional beep). Odd maps usually mix process with output (motors as output) or treat electricity as the only input.

Misconceptions & interventions

- **‘Electricity is the only input’ or ‘inputs are just buttons.’** — Point back to the toaster card and door map: bread, lever, dial and the motion sensor are inputs too. Say both can be true — power in and user/sensor signals.
- **‘The whole toaster is the process’ or ‘the motors are the output.’** — Trace the chain on the board: process is the hidden middle work (heating, control unit, motors driving); output is what you see or hear when it finishes (toast, open door, beep).
- **Pupils call the toaster a digital system.** — Restate the bridge: same IPO pattern for every device; digital systems use electronics or software in the process — tablet, Leap card reader, IWB — not the toaster.

Differentiation

Emerging	Developing	Proficient
• Let the group mime the device with hands first, then name each beat as in / middle / out; accept a simple three-box sketch with the three labels copied from the board.	• Ask whether each card is going in, happening inside, or coming out; if finished early, add a second tiny IPO map for a different device underneath.	• Stretch the journal map with a sensor input or two outputs (sight and sound); if mapping the toaster, note beside it that it is not a digital system. Judge door cards for other groups during the board sort.

Cross-curricular hook

Link to Irish daily tech — Leap card readers, shop self-checkouts and weather apps as IPO systems pupils already use.