

Inputs, processes and outputs

Lesson at a glance

Open with a toaster at breakfast and take quick pupil ideas for what goes in, what happens, and what comes out. Name the three parts as input, process and output, then drive the flow-builder interactive on the IWB to map a torch whole-class. Groups plan IPO on sticky notes for a device card, some stand on the shared floor labels to share, and a few act a human machine while watchers name the parts. Pupils draw one labelled IPO map in the Investigation Journal, then close with a short fault-finding talk.

Learning objectives

- Describe a technology as taking something in, doing something and giving something out
- Map a familiar device as input, process and output
- Show or name the three IPO parts in a human-machine act (as performer or watcher)

Before the bell – prep

Print one device card set (toaster, torch, automatic door, pencil sharpener) per group of 3–4. Lay three large floor or bench labels — Input, Process, Output — in a clear strip. Stock three sticky notes per group. Open the flow-builder interactive in explore mode, layout IPO, on the IWB.

Materials

Item	Qty	Per	Source	Low-cost substitute
device cards (toaster, torch, automatic door, pencil sharpener)	1	group	provided printable	write the four device names on folded scrap card
floor labels (Input, Process, Output)	1	class	classroom	three sheets of A4 paper with the words in marker
sticky notes or scrap paper for desk IPO planning	3	group	classroom	pupils sketch three labelled boxes in their rough book
real classroom examples to show (torch and pencil sharpener)	1	class	classroom	pictures of each device on the IWB only
Investigation Journal page	1	pupil	provided printable	plain paper with three labelled boxes drawn by the pupil

**Safety watch-point**

Keep bags and chairs clear of the shared floor strip and performance space so groups can stand and mime without tripping.

**Teaching moves**

- **Getting Started:** Hold up or show a toaster picture and take only three or four quick answers. Nudge anyone who says only “it makes toast” with What went in first? What did the toaster do? Keep device cards and floor labels nearby but unlaidd.
- **What is IPO?:** Project the short board definitions only; keep the full concept table for yourself. Model a pencil sharpener aloud — blunt pencil and turning the handle, blades shaving, sharp point and shavings — then have neighbours name one torch part each before a few share.
- **Build an IPO map on screen:** Drive the flow-builder interactive whole-class: drag press the switch to Input, electricity goes to the bulb inside to Process, beam of light to Output. Ask Are they right? What if the input never arrived? Clear and rebuild with the toaster cards if time allows.
- **Map devices on the floor:** Give each group one card and three sticky notes; they agree IPO at desks first. Invite two or three groups only to the shared strip to place notes, stand on the spots and say their parts. Ask watching groups Do you agree? What is the process? Correct gently if process and output are swapped.
- **Human machine:** Keep groups of three (fourth as narrator). Two minutes to plan, about one minute to perform; two to four groups is enough. Watchers must name all three parts when each act ends. Celebrate clear order and simple mime; offer Input/Process/Output role lines for the toaster if a group freezes.
- **Record your IPO map:** Pupils draw one device as a three-part IPO map on the Investigation Journal page and label each part. Circulate and ask one pupil per group to point to input, process and output and say them aloud.
- **How people use IPO:** Start from a torch that will not light, then try a silent school bell, bike light or blunt sharpener: which IPO part would you check first? Stress that non-digital tools use the same idea. Keep to five minutes.

**What it should show**

Torch: switch press → electricity to bulb → beam of light. Toaster: bread and lever → heat browns bread → hot toast. Door: person on mat/sensor → motor runs → door opens. Sharpener: blunt pencil and turn → blades shave → sharp point (and shavings). Surprises usually swap process with output (“toast” as the middle step) or name only the result — re-ask what the device does inside.



Misconceptions & interventions

- **Pupils name only the output** — “it makes light” or “it makes toast” — and skip what goes in and what happens inside. — Insist on all three every time: What went in first? What did it do inside? What came out? Point at the three floor labels or the on-screen IPO columns as they answer.
- **Pupils put the visible result in Process** (e.g. “toast pops up” as the middle step) instead of the internal action. — Keep process as the hidden middle only — heat browning the bread, blades shaving, electricity to the bulb. Have them re-stick the note under the correct floor label.
- **Pupils think IPO is only for computers or screens.** — Hold up the sharpener, toaster or door card and map all three parts aloud. Stress that technologists use IPO for any device when planning or finding a fault.

Differentiation

Emerging	Developing	Proficient
• Give spoken sentence stems: The input is... The process is... The output is... and allow a simple three-box sketch with one word per box. • Offer toaster role cards (Input / Process / Output with one example line each) if a human-machine group freezes.	• Ask watching groups to agree or challenge each shared IPO and name the process specifically. • On the Journal page, have them point to each part and say what would fail if that part were missing.	• Name a second input (e.g. electricity as well as bread for the toaster) on sticky notes or the Journal map. • On the fault-finding talk, say which IPO part to check first for a silent school bell or bike light and why.

Cross-curricular hook

Links to oral language: pupils rehearse clear sequenced explanations when they stand on the floor spots and when watchers name each part.