

technology

Inputs, processes and outputs

Lesson at a glance

Open from a breakfast toaster and gather three quick answers for what goes in, what happens inside and what comes out. Name the trio as IPO, then model the torch once on the flow-builder interactive. Groups plan IPO sticky notes for a toaster, automatic door or pencil sharpener and place them on a shared floor strip. Two to four groups act a working then broken human machine while watchers spot which part failed. Pupils draw one IPO map in the Investigation Journal, then use IPO to say where to look first on a dark torch or silent school bell.

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 per group of 3–4 (toaster, automatic door, pencil sharpener; hold the torch card back). Cut three large floor labels—Input, Process, Output—and set three sticky notes per group. Have the flow-builder interactive ready on the IWB in IPO layout. A real sharpener or torch helps the worked model if to hand.

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**

Clear floor space before the shared strip and human-machine acts. No running; one group on the labels at a time so feet and sticky notes do not become trip hazards.

**Teaching moves**

- **Getting Started:** Hold up or show a toaster picture. Take only three or four answers—bread in, heat/toasting, toast out. If someone says only 'it makes toast', nudge: What went in first? What did the toaster do? Keep device cards and floor labels nearby but unlaidd.
- **What is IPO?:** Project only the short board text. Say the pencil-sharpener worked model aloud while pointing at a real sharpener if you have one: blunt pencil and turn of the handle; blades shaving; sharp point and shavings. Insist on all three parts every time and keep process as the hidden internal action, not the result the user sees.
- **Build an IPO map on screen:** Drive the flow-builder interactive yourself—pupils stay off devices. Drag press the switch → Input, electricity goes to the bulb inside → Process, beam of light → Output, thinking aloud. Fold the class in: Are they right? What if the input never arrived? Do not map a second device here; the torch is the only worked example.
- **Map devices on the floor:** Hand toaster, automatic door or pencil sharpener first; give the torch only to a fifth group asked to find a part the board map left out. Groups agree IPO on sticky notes at desks, then two or three groups place notes on the shared strip and stand on each label while saying their parts. Watching groups may be asked: Do you agree? What is the process? Correct gently if process and output are swapped.
- **Human machine:** Keep groups of three (fourth can narrate). Two minutes to plan, about one minute to perform; two to four groups is enough. Every act runs twice—once working, once with one part quietly refusing. Tell performers privately which part to break. Watchers name which part stopped and what they saw, not the three IPO labels again. Celebrate clear mime over long plays.
- **Record your IPO map:** Pupils draw one device as input-process-output on the Investigation Journal page and label each part. Circulate and ask one pupil per group to point and say each part aloud. Allow a three-box sketch with one word each if needed.
- **How people use IPO:** Start from a torch that will not light: look at input, process or output first? Stay concrete—school bell, bike light, blunt sharpener. Stress that non-digital tools use the same idea. Keep to five minutes, then tidy.

**What it should show**

Strong maps name a clear starter (bread and lever / foot on mat / blunt pencil and turn), an internal action (heat browns / motor runs / blades shave), and a finished job (toast pops / door opens / sharp point and shavings). Human-machine watchers should spot the broken part from what they saw, not by guessing. Common slip: process and output swapped—toast named as process, or 'door opens' treated as the middle step.

Misconceptions & interventions

- Pupils name only the output—‘it makes light’ or ‘it makes toast’—and skip what went in and what happened inside. — Point back at the three floor labels or the torch cards on the flow-builder. Ask: What started it? What did it do you could not see? What came out last?
- Pupils treat the visible result as the process—‘the process is toast popping up’ or ‘the process is the beam’. — Say process is the hidden middle job only. For the torch, restate electricity going to the bulb inside; for the toaster, heat browning the bread—keep the pop-up or the beam as output.
- Pupils think IPO is only for computers or screens. — Hold up the sharpener, toaster or door card and walk the same three labels. Technologists use IPO on any device to plan it or to find which part has gone wrong.

Differentiation

Emerging	Developing	Proficient
• Say the stems aloud—The input is... The process is... The output is...— and offer role cards (Input / Process / Output) with one toaster example line each if a group freezes. • Allow a simple three-box Investigation Journal sketch with one word in each box.	• Invite watching groups to say whether they agree and to name the process after a floor share. • Ask one pupil per group to point to each part of their Journal map and say it aloud.	• Confident groups name a second input (e.g. electricity as well as bread) or note what would break if one part failed. • A fifth group with the torch card finds a part the board map left out.

Cross-curricular hook

Link to oral language: groups rehearse clear three-part explanations, then watchers justify which part failed from evidence they saw.