Examples for All 40 TRIZ Principles

No.	Principle	Description	Example
1	**Segmentation**	Divide an object into independent parts.	A shelf that comes as flat-pack pieces so you can carry it home and assemble it easily.
2	**Taking out**	Extract the disturbing part or property from an object.	Noise-cancelling headphones remove unwanted background sound rather than trying to overpower it.
3	**Local quality**	Change the structure of an object from uniform to non-uniform.	A frying pan with a non-stick surface only on the cooking area, not on the handle.
4	**Asymmetry**	Change the shape of an object to be asymmetrical.	A hammer with a heavier head on one side for better striking force.
5	**Merging**	Combine identical or similar objects.	A printer that includes a scanner and copier in one device.
6	**Universality**	Make an object perform multiple functions.	A Swiss Army knife that has multiple functions in one compact tool.
7	**Nested doll**	Place one object inside another.	Luggage that fits inside bigger luggage for storage.
8	**Counterbalance**	Compensate for the weight or force.	A spring-loaded door that closes gently instead of slamming.
9	**Preliminary anti-action**	Take preventive measures before actions.	Gritting roads before a frost to prevent ice forming.
10	**Prior action**	Perform the required change before the actual process starts.	Preheating the oven before baking.
11	**Beforehand compensation**	Prepare for potential losses.	Keeping a spare tyre in your car in case of punctures.
12	**Equipotentiality**	Remove the need for gravity.	Hanging a picture using two hooks so it doesn't tilt or sag on one side.
13	**The other way round**	Invert the process or action.	Reversing the flow: vacuum cleaners blow air out but keep dust in.
14	**Spheroidality**	Use a spherical shape.	Using wheels instead of dragging a heavy object.
15	**Dynamicity**	Allow modifications during the process.	An adjustable office chair that adapts to different heights and postures.

16	**Partial or excessive action**	Use more (or less) than necessary.	Loosening a tight bolt first before tightening it again.
17	**Another dimension**	Move into a different dimension.	Stacking shelves vertically instead of spreading items across the floor.
18	**Mechanical vibration**	Use vibrations to improve the process.	An electric toothbrush using vibration to clean more effectively.
19	**Periodic action**	Make use of periodic changes.	A sprinkler system that sprays water in pulses instead of continuously.
20	**Continuity of useful action**	Ensure continuous performance.	An escalator that keeps moving so people can get on at any time.
21	**Skipping**	Eliminate an action or step.	Paying by tapping a card instead of typing in a PIN.
22	**Conversion of harm into benefit**	Transform a harmful factor into something beneficial.	Using waste heat from a factory to warm nearby buildings.
23	**Feedback**	Implement feedback mechanisms for improvement.	A thermostat that checks room temperature and adjusts heating automatically.
24	**Intermediary**	Use intermediaries to facilitate functions.	Using a funnel to pour liquid neatly into a bottle.
25	**Self-service**	Automate processes to reduce human intervention.	Petrol stations where you pump your own fuel instead of relying on staff.
26	**Copying**	Create copies of effective solutions.	Testing designs in software simulations instead of using expensive prototypes.
27	**Dispose and regenerate**	Replace failed elements with new ones.	Replacing only the ink cartridge in a pen instead of throwing away the whole pen.
28	**Use of excess properties**	Make use of properties that were not previously used.	Using wasted roof space to collect solar power.
29	**Use of fluids**	Incorporate fluid dynamics for improved performance.	Hydraulics that lift a car in a garage.
30	**Flexible shells and thin films**	Utilise flexible materials for better adaptability.	A waterproof jacket with a thin breathable membrane.
31	**Porous materials**	Introduce pores or perforations to lighten, filter or regulate flow.	A sponge that absorbs water through its holes.
32	**Changing colour**	Alter colour, brightness or transparency to signal, protect or improve performance.	A battery indicator that turns red when power is low.

33	**Homogeneity**	Use the same material or environment to simplify interactions and reduce conflict.	Using the same plastic for all parts of a toy to make recycling easier.
34	**Rejecting and recovering parts**	Remove parts when they are not needed and restore them when they are.	A fold-out table where legs tuck away when not needed.
35	**Parameter changes**	Adjust key characteristics such as temperature, pressure, size or concentration.	Turning up the heat to boil water faster.
36	**Phase transitions**	Use changes of state, such as melting or evaporation, to achieve the desired effect.	Using dry ice (solid CO_2) that sublimates to create fog effects.
37	**Thermal expansion**	Make use of materials that expand or contract with temperature changes.	A bimetallic strip in a thermostat that bends when heated.
38	**Strong oxidisers**	Apply oxygen-rich or reactive agents to speed up or enhance a process.	Hydrogen peroxide used to clean and disinfect surfaces.
39	**Inert atmosphere**	Surround an object with a non-reactive environment to protect or stabilise it.	Storing crisps in nitrogen-filled bags to keep them fresh.
40	**Composite materials**	Combine different materials to create improved or balanced properties.	Fibreglass, which mixes glass fibres with resin to create a strong, light material.