MATERIALS

18 CARDS / DRAW ONE

CONTRAPTION

SHUFFLE

MATERIALS

18 CARDS / DRAW ONE

CONTRAPTION

SHUFFLE

MATERIALS M01

BUILD WITH...

Corrugated cardboard



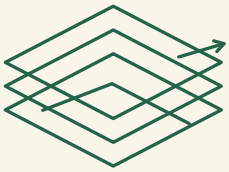
Use the ridged layers of a shipping box as your main building material. Cut, fold or laminate them.

FOLD / STACK / SLOT

MATERIALS M02

BUILD WITH...

Paper



Make paper do the work. Fold, roll, pleat or layer ordinary sheets into a useful structure.

FOLD / ROLL / PLEAT

MATERIALS M03

BUILD WITH...

Scrap wood



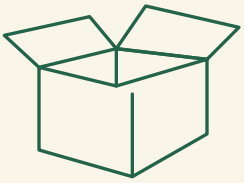
Give a wooden offcut another job. Make it a useful part of your contraption.

JOIN / STACK / SHAPE

MATERIALS M04

BUILD WITH...

Discarded packaging



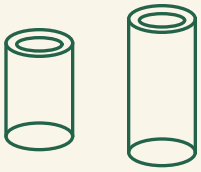
Turn a clean box, carton or packing insert into the main structure of your build.

RESCUE / REBUILD

MATERIALS M05

BUILD WITH...

Paperboard tubes



Build around one or more paperboard tubes. Use their hollow shape, or cut and reshape them.

ROLL / NEST / JOIN

MATERIALS M06

BUILD WITH...

Craft sticks



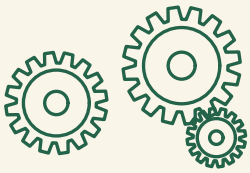
Use craft sticks as the main structural pieces. Connect them into something that works.

BRIDGE / LINK / LAYER

MATERIALS M07

BUILD WITH...

Bottle caps



Make clean bottle caps an essential part of your build. Explore their rims, circles and small size.

ROLL / STACK / SORT

MATERIALS M08

BUILD WITH...

Plastic bottles



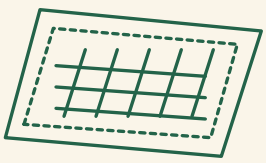
Give a clean plastic bottle a new purpose. Use its body, neck or flexible walls in your build.

SQUEEZE / SHAPE / HOLD

MATERIALS M09

BUILD WITH...

Fabric scraps



Make fabric an essential working part. Fold, stretch, tie or stitch your scraps into shape.

STITCH / STRETCH / FOLD

MATERIALS

18 CARDS / DRAW ONE

CONTRAPTION SHUFFLE

MATERIALS

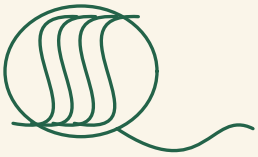
18 CARDS / DRAW ONE

CONTRAPTION SHUFFLE

MATERIALS M10

BUILD WITH...

String or yarn



Use string or yarn to carry a load, connect parts or transmit motion. Put tension to work.

TIE / WEAVE / PULL

MATERIALS M11

BUILD WITH...

Thin craft wire



Bend thin craft wire into a useful structure or moving part. Give those lines a job to do.

BEND / LOOP / TWIST

MATERIALS M12

BUILD WITH...

Rubber bands



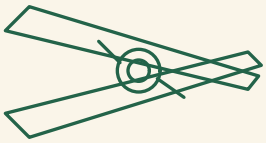
Put rubber bands to work. Use their stretch, grip or stored energy as a key part of your build.

STRETCH / GRIP / RETURN

MATERIALS M13

BUILD WITH...

Clothespins



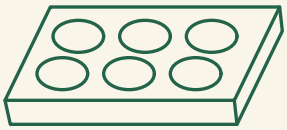
Use wooden clothespins as working parts. Try their jaws, spring or wooden halves.

CLAMP / JOIN / RELEASE

MATERIALS M14

BUILD WITH...

Egg cartons



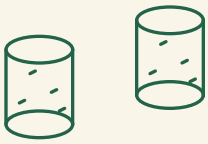
Turn a clean egg carton into a useful structure. Explore its cups, ridges and folding lid.

CUP / CUT / CONNECT

MATERIALS M15

BUILD WITH...

Corks



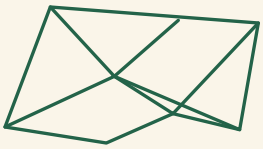
Use corks as key parts in your invention. Explore their grip, buoyancy or rounded shape.

FLOAT / ROLL / GRIP

MATERIALS M16

BUILD WITH...

Aluminum foil



Make foil do useful work. Fold, crumple or layer it into a shape that helps your invention.

FOLD / PRESS / REFLECT

MATERIALS M17

BUILD WITH...

Fallen twigs



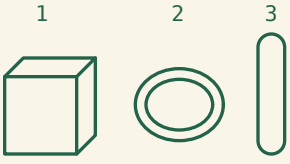
Gather fallen twigs and build with their natural shapes. Join them into a useful structure.

LASH / BRANCH / BALANCE

MATERIALS M18

BUILD WITH...

Three rescued objects



Choose three clean objects headed for the trash. Give all three a useful role in one contraption.

RESCUE / COMBINE / REUSE

MECHANISM

18 CARDS / DRAW ONE

CONTRAPTION

SHUFFLE



SHUFFLE

CONTRAPTION

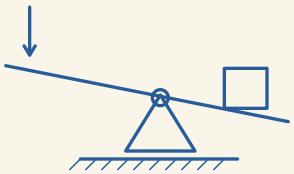
18 CARDS / DRAW ONE

MECHANISM

MECHANISM K01

MAKE IT WORK WITH...

Lever



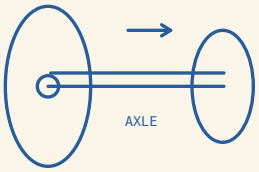
Pivot a bar on a support. Use movement at one end to lift, push or move something at the other.

PIVOT / PUSH / LIFT

MECHANISM K02

MAKE IT WORK WITH...

Wheel and axle



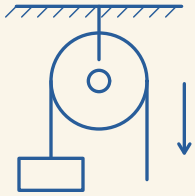
Connect a wheel to a shaft so they turn together. Use their rotation to help accomplish the mission.

TURN TOGETHER

MECHANISM K03

MAKE IT WORK WITH...

Pulley



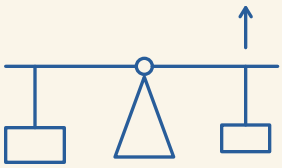
Run a cord over a turning wheel. Use it to redirect a pull or help move a load.

GUIDE THE PULL

MECHANISM K04

MAKE IT WORK WITH...

Counterweight



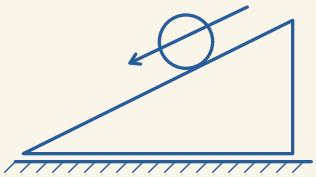
Use one weight to balance or move another part. The balancing weight must do useful work.

BALANCE / MOVE

MECHANISM K05

MAKE IT WORK WITH...

Ramp



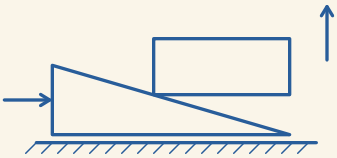
Use a sloped surface to guide motion or raise an object gradually. Make the slope do useful work.

GUIDE ALONG A SLOPE

MECHANISM K06

MAKE IT WORK WITH...

Wedge



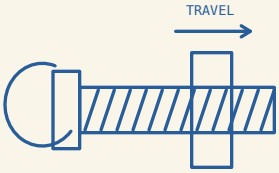
Push a tapered piece between surfaces. Use its shape to lift, separate or hold something.

PUSH / SEPARATE / HOLD

MECHANISM K07

MAKE IT WORK WITH...

Screw



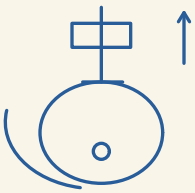
Use a threaded connection to turn rotation into straight-line movement or a holding force.

TURN INTO TRAVEL

MECHANISM K08

MAKE IT WORK WITH...

Cam and follower



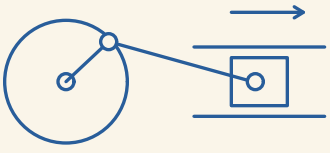
Turn a shaped wheel against a follower. Use its changing profile to lift or move the follower.

TURN INTO A REPEAT

MECHANISM K09

MAKE IT WORK WITH...

Crank and slider



Connect an off-center crank pin to a guided slider. Turn the crank to create back-and-forth travel.

TURN / PUSH / PULL

MECHANISM

18 CARDS / DRAW ONE

CONTRAPTION
SHUFFLE

MECHANISM

18 CARDS / DRAW ONE

CONTRAPTION
SHUFFLE

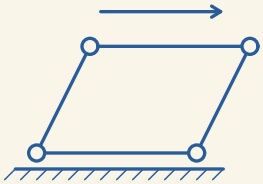
MECHANISM

18 CARDS / DRAW ONE

MECHANISM K10

MAKE IT WORK WITH...

Linkage



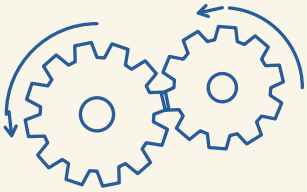
Join rigid pieces with pivots. Use the connected pieces to guide or transfer movement.

CONNECT THE MOTION

MECHANISM K11

MAKE IT WORK WITH...

Meshing gears



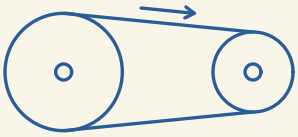
Make toothed wheels engage. Use one gear to turn another and help accomplish the mission.

TEETH TRANSFER MOTION

MECHANISM K12

MAKE IT WORK WITH...

Belt drive



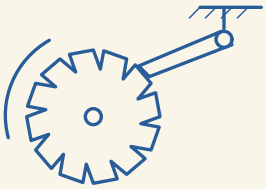
Loop a belt around two wheels. Use the belt to carry rotation from one wheel to the other.

CONNECT TWO WHEELS

MECHANISM K13

MAKE IT WORK WITH...

Ratchet and pawl



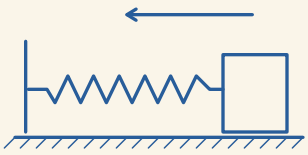
Let a catch engage a toothed wheel or strip. Allow motion one way and resist it the other way.

ADVANCE / HOLD

MECHANISM K14

MAKE IT WORK WITH...

Spring return



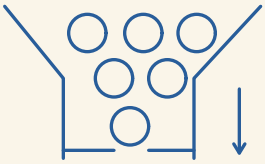
Store energy in a spring or elastic part. Release it to bring a moving part back toward its start.

STRETCH / RELEASE

MECHANISM K15

MAKE IT WORK WITH...

Gravity feed



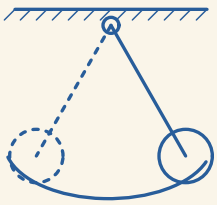
Arrange parts so gravity supplies the motion. Guide objects toward a useful destination.

LET GRAVITY WORK

MECHANISM K16

MAKE IT WORK WITH...

Pendulum



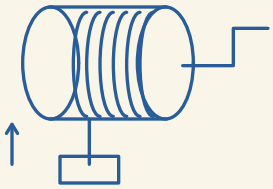
Hang a weight from a pivot and let it swing. Use the repeated motion to help with your mission.

SWING FROM A PIVOT

MECHANISM K17

MAKE IT WORK WITH...

Spool and cord



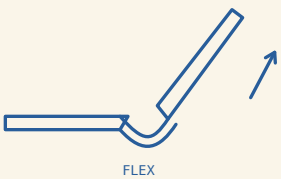
Wind or unwind a cord around a drum. Use the changing cord length to move another part.

WIND / LIFT / RELEASE

MECHANISM K18

MAKE IT WORK WITH...

Flexible hinge



Join two parts with a bendable strip. Make movement happen by bending the joint.

BEND AT THE JOINT

MISSION

18 CARDS / DRAW ONE

CONTRAPTION
SHUFFLE

MISSION

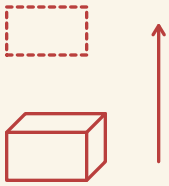
18 CARDS / DRAW ONE

CONTRAPTION
SHUFFLE

MISSION G01

MAKE IT...

Lift a small object



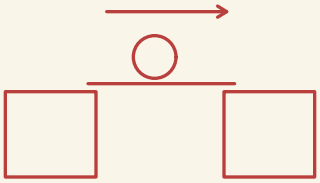
Raise a small object from a lower level to a higher one. Let your mechanism do the lifting.

TEST: SHOW A CLEAR LIFT

MISSION G02

MAKE IT...

Cross a gap



Move a small object from one side of a gap to the other. Keep it out of the space below.

TEST: REACH THE FAR SIDE

MISSION G03

MAKE IT...

Deliver a message



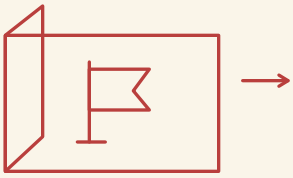
Carry a written or drawn message from its starting point to a waiting recipient.

TEST: MESSAGE RECEIVED

MISSION G04

MAKE IT...

Reveal something hidden



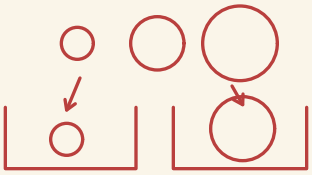
Keep an object or message concealed. Operate your contraption to bring it into view.

TEST: HIDDEN TO VISIBLE

MISSION G05

MAKE IT...

Sort by size



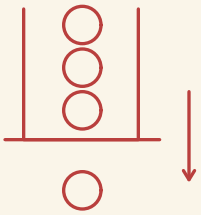
Separate a mixed collection into at least two size groups. Make the contraption help decide.

TEST: TWO DISTINCT GROUPS

MISSION G06

MAKE IT...

Dispense one at a time



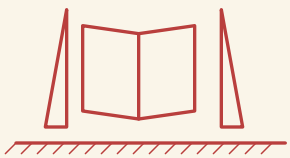
Hold several similar objects. Release just one during each operating cycle.

TEST: ONE PER CYCLE

MISSION G07

MAKE IT...

Hold it in position



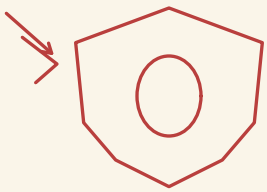
Keep an object in a chosen position without holding it yourself. Show that it stays put.

TEST: LET GO; IT STAYS

MISSION G08

MAKE IT...

Protect something fragile



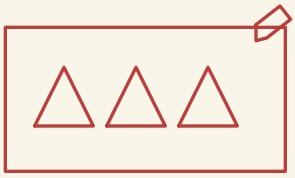
Build a way to protect a fragile object from a small bump. Use a harmless stand-in first.

TEST: SURVIVE A SMALL BUMP

MISSION G09

MAKE IT...

Draw a repeating pattern



Move a drawing tool or a surface to make a pattern repeat. Let the mechanism guide it.

TEST: REPEAT THREE TIMES

MISSION

18 CARDS / DRAW ONE

CONTRAPTION
SHUFFLE

MISSION

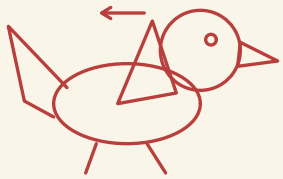
18 CARDS / DRAW ONE

CONTRAPTION
SHUFFLE

MISSION G10

MAKE IT...

Bring a creature to life



Give an imagined creature a convincing movement. Make it nod, flap, crawl or express a mood.

TEST: SHOW ITS MOVEMENT

MISSION G11

MAKE IT...

Give a visible signal



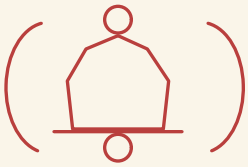
Make a clear visual change that someone can recognize from across a table.

TEST: SPOT THE CHANGE

MISSION G12

MAKE IT...

Make a sound



Create an intentional sound when your contraption operates. Make it happen again on demand.

TEST: SOUND ON DEMAND

MISSION G13

MAKE IT...

Compare two weights



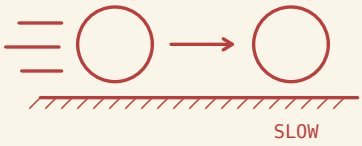
Show which of two small objects is heavier, or whether they balance. Use the same test for both.

TEST: SWAP AND COMPARE

MISSION G14

MAKE IT...

Slow a moving object



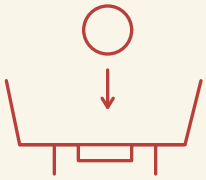
Make an object move more slowly than it would without your contraption. Compare both runs.

TEST: COMPARE THE MOTION

MISSION G15

MAKE IT...

Catch and release



Catch a small moving object, hold it briefly, then release it through your mechanism.

TEST: CATCH / HOLD / LET GO

MISSION G16

MAKE IT...

Fold into less space



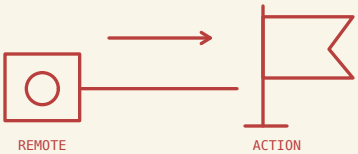
Make a useful structure that folds into a smaller form. Open it again and show it still works.

TEST: FOLD AND REOPEN

MISSION G17

MAKE IT...

Operate from a distance



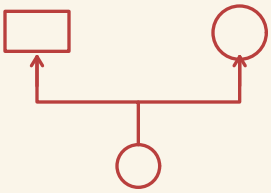
Control an action from beyond arm's reach. Keep your hands away from the part doing the job.

TEST: WORK IT FROM AFAR

MISSION G18

MAKE IT...

Move two things together



Use one input to make two separate parts move at the same time. Give both parts a visible job.

TEST: ONE INPUT; TWO MOVES