

ILLUSTRATED STEPS / SAVE IT. FIND IT. BUILD IT.

HAND FAN

The bottle-fan episode explained. Build a folding paper fan.



START HERE

01

GET READY

Tools + clickable build map

02

FOLLOW THE STEPS

One clearly numbered stage at a time

03

FIND IT AGAIN

Quick reference + PDF bookmarks

Explore rubber-band energy, then build a folding paper fan. The video's rotor connection is unverified; this guide provides a simpler alternative.

NUKE ON TIKTOK

MORE FREE BUILD GUIDES

SOURCES / Science Buddies: stored energy

BUILD MAP

NEXT

YOUR BUILD MAP

Tap a step to jump there. The printed page numbers work offline too.

HAVE THESE READY

- One A4 or US Letter sheet of printer paper
- Ruler marked in millimeters
- Pencil
- Paper tape
- Flat, dry work surface

READ IN ORDER

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BEFORE YOU START

Folding paper fan alternative to the bottle-fan episode. Bottle rotor connection remains unverified. No heated plastic or cut bottle blades. Comfort aid only; heat illness needs proper help.

KEEP THIS COPY

Save the PDF with its guide ID. Use the build map, bookmarks, or your PDF reader's search to find a step later. Video and source links need internet; the instructions do not.

QUICK REFERENCE / PAGE 11

SETUP

What winds up must unwind

READ BEFORE STEP 01

PREP

The episode demonstrates stored energy, not free power.



THE REAL PRINCIPLE

- **Twisting a rubber band stores energy from your hand.**
- When released, the band can drive a moving part.
- Friction and air resistance consume that stored energy; more winding is not unlimited power.

THE UNRESOLVED DETAIL

- **A spinning rotor needs to turn independently of its handle.**
- The episode documents do not establish that connection clearly enough for a reproducible bottle build.
- Do not heat plastic, cut bottle blades or copy the pictured assembly from this guide.

SOURCES / Science Buddies: stored energy

BUILD MAP

PREVIOUS

NEXT

SETUP

Choose the paper version

READ BEFORE STEP 01

PREP

This is a hand-powered craft, not heat-stroke protection.



GATHER THE KIT

- Use one sheet of ordinary printer paper, A4 or US Letter; a ruler; pencil; and paper tape.
- No bottles, matches, hot nail, blades or rubber band are needed.
- Work on a flat table.

PLAN THE SHAPE

- The whole sheet becomes an accordion.
- A short taped section becomes the grip; the untaped length opens into the fan.
- Keep it dry and away from flames.

SOURCES /

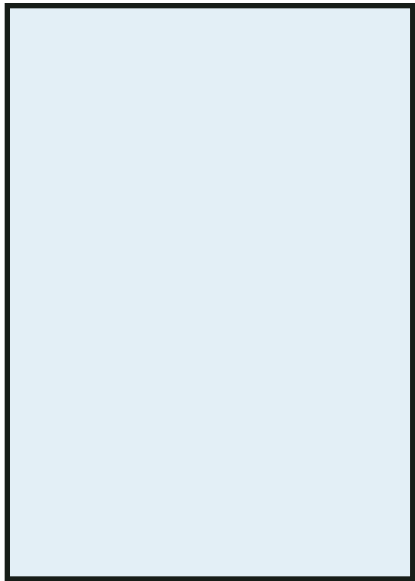
STEP

Place your sheet

1 OF 5 / READ IN ORDER

01

Start with the sheet upright, short edge across the top.



A4 or US Letter

One light, uncoated sheet. No scissors or motor needed.

SET THE SIZE

- Use A4, 210 x 297 mm, or US Letter, about 216 x 279 mm.
- Leave the sheet whole.
- Clear enough table space to turn it over repeatedly.

CHECKPOINT

- The long edges run up and down.
- Your fold lines will run left to right, parallel to the short edge.

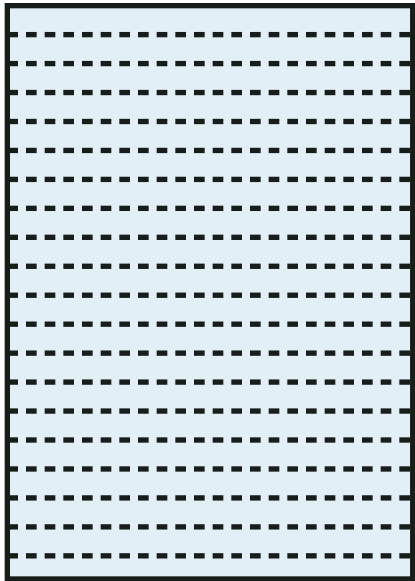
STEP

Mark equal pleats

2 OF 5 / READ IN ORDER

02

A regular spacing makes the next step easier.



A4 or US Letter

Long edge vertical. Creases run across the short width.

Mark about 15 mm apart down BOTH long edges.

MARK BOTH SIDES

- Along each long edge, make small pencil marks every 15 mm from the top.
- Join matching marks lightly with the ruler.
- A shorter final strip is fine.

CHECKPOINT

- All lines run parallel across the sheet.
- Do not cut them.
- The marks are fold guides, not blade outlines.

STEP

Fold back and forth

3 OF 5 / READ IN ORDER

03

Alternate directions to make a zigzag stack.

EDGE VIEW / ALTERNATE DIRECTIONS



Fold forward, turn the sheet over, fold back. Keep each pleat aligned with the one beneath it.

MAKE THE ACCORDION

- **Fold the top strip over at the first line and crease it.**
- Turn the sheet over.
- Fold at the next line, then turn it over again.
- Continue to the bottom.

CHECKPOINT

- **Look at one end: the folds form a zigzag, not a rolled tube.**
- Press the stack flat.
- Its length still matches the paper's original short edge.

SOURCES / Smithsonian: fan folds

STEP

Tape a firm grip

4 OF 5 / READ IN ORDER

04

Hold one end closed; leave most of the stack free.

TAPE THE LAST 30 mm AT ONE END



Taped grip

Keep the remaining pleats free to open.

BIND ONE END

- **Measure 30 mm from one end of the flattened stack.**
- Wrap paper tape around that short section.
- Press the tape down without covering the remaining length.

CHECKPOINT

- **Hold the taped grip and gently spread the opposite ends of the pleats.**
- The untaped section should open into a wedge.
- If it tears, retape the grip or start with a fresh sheet.

SOURCES /

BUILD MAP

PREVIOUS

NEXT

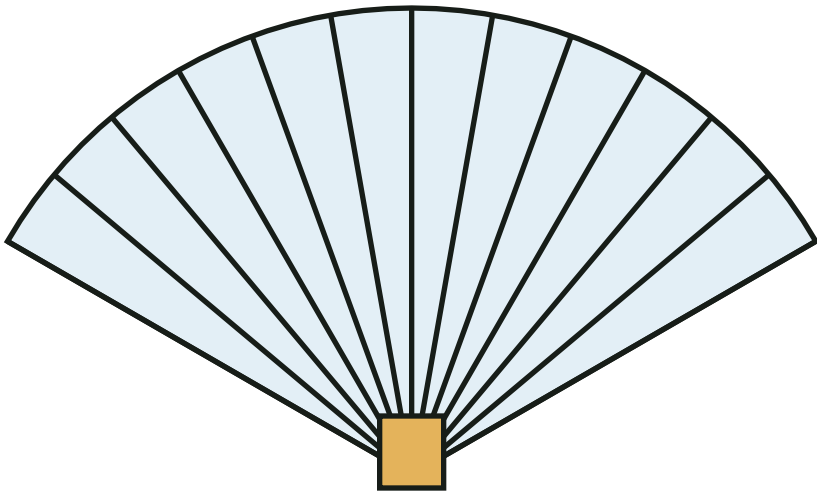
STEP

Open, try and pack away

5 OF 5 / READ IN ORDER

05

Move your hand gently to move the air.



OPEN GENTLY

Hold the grip. Wave by hand. Close for storage.

TRY A SMALL BREEZE

- **Hold the grip and fan gently toward your forearm.**
- Keep paper edges away from eyes.
- If the folds collapse, open less widely and use slower strokes.
- Do not promise a room-cooling effect.

KEEP IT USABLE

- **Close the pleats along the existing creases.**
- Store the dry fan flat in a bag or notebook.
- Replace soggy, torn or dirty paper; save this guide to fold another.

SOURCES /

BUILD MAP

PREVIOUS

NEXT

NOTE

When a fan is not enough

KEEP THESE LIMITS WITH THE STEPS

REF

Heat illness needs action beyond a craft project.



GET SOMEWHERE COOLER

- **During extreme heat, seek a cooler or air-conditioned place, rest and drink water if you can safely swallow.**
- A paper fan is a comfort aid, not a substitute for safer surroundings.

EMERGENCY SIGNS

- **Confusion or collapse in the heat can mean heat stroke.**
- Call emergency services, move to a cool place and cool the person with wet cloths or misting and fanning.
- Do not give drinks to someone with suspected heat stroke.

SOURCES / Red Cross: extreme heat

BUILD MAP

PREVIOUS

NEXT

QUICK REFERENCE

Read the full steps first. Tap any row to return to its instructions.

BEFORE STEP 01

Folding paper fan alternative to the bottle-fan episode. Bottle rotor connection remains unverified. No heated plastic or cut bottle blades. Comfort aid only; heat illness needs proper help.

- 01

Place the sheet

A4 or Letter upright; fold lines run across its short width.

P05
- 02

Mark 15 mm pleats

Mark down both long edges and connect across. Do not cut.

P06
- 03

Alternate folds

Turn the sheet over at every fold; check for a zigzag.

P07
- 04

Tape a 30 mm grip

Bind one end of the flattened stack; spread the untaped length.

P08
- 05

Try and store

Fan gently; close creases and keep the paper dry.

P09

NUKE SAYS

The survival skill is knowing when to stop tinkering.

SOURCES / Red Cross: extreme heat