

# Small pocket. Big decisions.

Become a designer for a costume studio. Your challenge: make a paper pocket that holds three message cards, then improve it after a test. You will read, measure, sketch, build, and explain your choices.

## Your studio schedule

Session 1 · 45 minutes: meet the design problem, read the story, and work out the measurements. Session 2 · 45 minutes: choose a design, build a model, test it, and share what changed.

## Gather your tools

Pencil, ruler marked in centimetres, scrap paper, one backing sheet, tape, and scissors with adult help as needed. Paper and tape models only; this is not a sewing or wearable-product test.

**START** Before reading: what makes a pocket useful? Write or tell an adult two ideas.

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## Success looks like this

I can explain a need, calculate a cut size, compare two ideas, and use a test to improve my model. The aim is thoughtful decisions; drawing skill is not being graded.

Print note: page 7 is a cutting template. Print single-sided at actual size (100%). Check its 2 cm scale mark.

# The pocket that had to earn its place

## 1 / A small problem worth noticing

At a make-believe school costume studio, a young designer named Ari had a problem. The actors carried message cards between scenes, but the cards kept sliding out of their costumes. One actor tucked a card under a belt. Another held it in one hand and forgot a gesture. Ari first imagined a brilliant silver pocket shaped like a lightning bolt. It looked exciting in a sketch. Then Ari asked a better question: what did the pocket need to do? The answer was simple enough to test. It had to hold three message cards, let an actor reach them quickly, and stay closed at the bottom when the actor moved.

## 2 / Turn a wish into a brief

A design brief is a short description of a problem, the person who has it, and what a solution must achieve. Ari wrote: "Create a paper model of a pocket that holds three cards and is easy to use." A paper model would not be a finished costume. It was a quick way to explore an idea before choosing fabric or asking an adult to help with sewing. Ari added constraints: use one sheet of scrap paper for the pocket, attach it to a separate backing sheet, and finish the first model in twelve minutes. Constraints narrowed the choices, but they still left room for imagination.

## 3 / Give materials a job

Ari compared two imaginary materials. One was stiff and kept a crisp shape. The other was soft and bent easily. Neither was automatically better. A stiff pocket might be easier to open, but it might stick out awkwardly. A soft pocket might follow a costume's shape, but it could collapse when someone tried to slide in a card. Ari drew two openings: a straight edge and a shallow curve. The sketches were not a competition to make the prettiest picture. Each one suggested a different way to solve the same problem. Labels explained what the drawings alone could not show.

# The pocket that had to earn its place

## 4 / Measure what disappears

The next surprise came from folding. Ari wanted the finished pocket to be twelve centimetres wide and fourteen centimetres tall. Cutting a rectangle exactly that size would not work if some paper had to fold behind the edges. Ari allowed one extra centimetre on each side, one at the bottom, and two at the top. Those hidden margins were allowances. They were part of the cut rectangle, but not part of its finished face. Ari drew a larger rectangle and marked each fold before cutting. A ruler turned the design from a guess into something another person could reproduce.

## 5 / Let a test change your mind

The first prototype, or early model, looked neat on the table. Ari attached its folded side and bottom tabs to a backing sheet, leaving the top open. Three paper cards fitted inside. That seemed like success, until Ari lifted the backing sheet upright and gently tilted it from side to side. One corner began to open. Instead of calling the whole design a failure, Ari recorded the observation: "The lower left attachment loosened during the tilt test." This was more useful than "bad pocket" because it named something that could change. Ari reinforced that corner, repeated the same test with the same cards, and compared the result. A fair comparison needed a similar test.

## 6 / Explain a choice

Ari's final model still looked like folded paper. That was fine. Its job was to help answer a question, not to pretend it was a finished garment. For the studio display, Ari wrote a small label explaining the user, one constraint, and one improvement supported by a test. Another designer chose a different opening and produced an equally thoughtful solution. Good design did not require everyone to make the same object. It required noticing a need, trying possibilities, and explaining decisions. The lightning-bolt decoration could return later, if Ari still wanted it. Now it would belong to a pocket with a purpose.

# Read like a designer

Use the story on pages 2-3. You may write short answers, dictate, or discuss and let an adult jot down your ideas.

**Q01** Name two things the actors needed the pocket to do. Where did you find them?

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**Q02** Why was “The lower left attachment loosened” more useful than “bad pocket”? Use an idea from section 5.

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**Q03** Invent a different constraint for a pocket. Explain one design choice that your constraint might change.

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## Designer words

**Brief:** the problem and requirements. **Constraint:** a limit you must work within. **Allowance:** extra material outside the finished face. **Prototype:** an early model used to explore or test an idea.

Return to your starting ideas on page 1. Circle or tell an adult one idea you would now make more specific.

# Measure what folds away

The finished face is the visible rectangle after the margins fold backward. For this simple model, add both side allowances to the finished width. Add the top and bottom allowances to the finished height.

## Worked example

A finished face 8 cm wide and 10 cm tall needs 1 cm on each side, 1 cm at the bottom, and 2 cm at the top. Cut width =  $8 + 1 + 1 = 10$  cm. Cut height =  $10 + 1 + 2 = 13$  cm.

**Q04** Our finished face is 12 cm wide and 14 cm tall. Use the same allowances. What width and height should you cut? Show both calculations.

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**Q05** You have two scrap rectangles: A is  $15 \times 20$  cm; B is  $13 \times 25$  cm. Which can fit your entire cut rectangle? Keep edges parallel; you may turn the sheet. Explain why.

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## Check with your adult before cutting

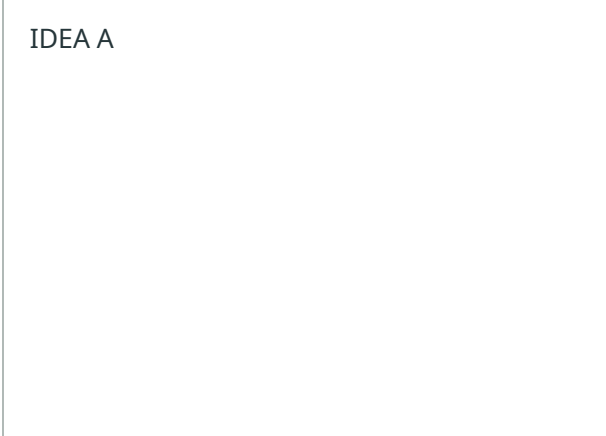
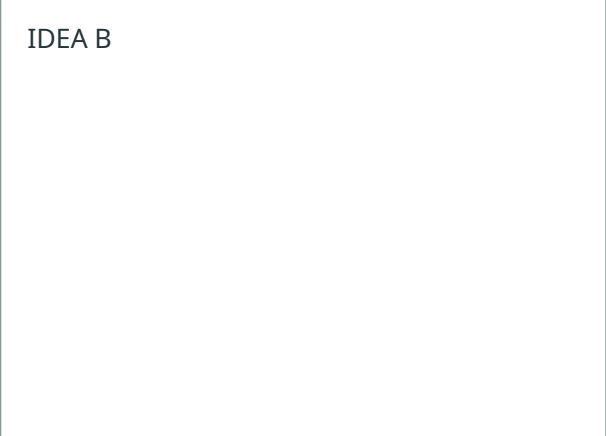
Compare your calculated cut size to the template on page 7. Measure its outside edges and scale mark. If the printer changed its size, draw your own rectangle using your calculated dimensions.

Optional stretch (extra time): How many square centimetres are in one cut rectangle? How much for two?

# Two ideas. One decision.

Keep the same rectangular pocket face and allowances so the template still works. Your choices can change decoration, labels, opening details above the fold, or how a user finds the cards. Do not cut below the top fold line.

**Q06** Sketch two possibilities. Label a useful feature in each. Choose one and explain how it helps the user.

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|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <p>IDEA A</p>  | <p>IDEA B</p>  |
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## Build your first prototype

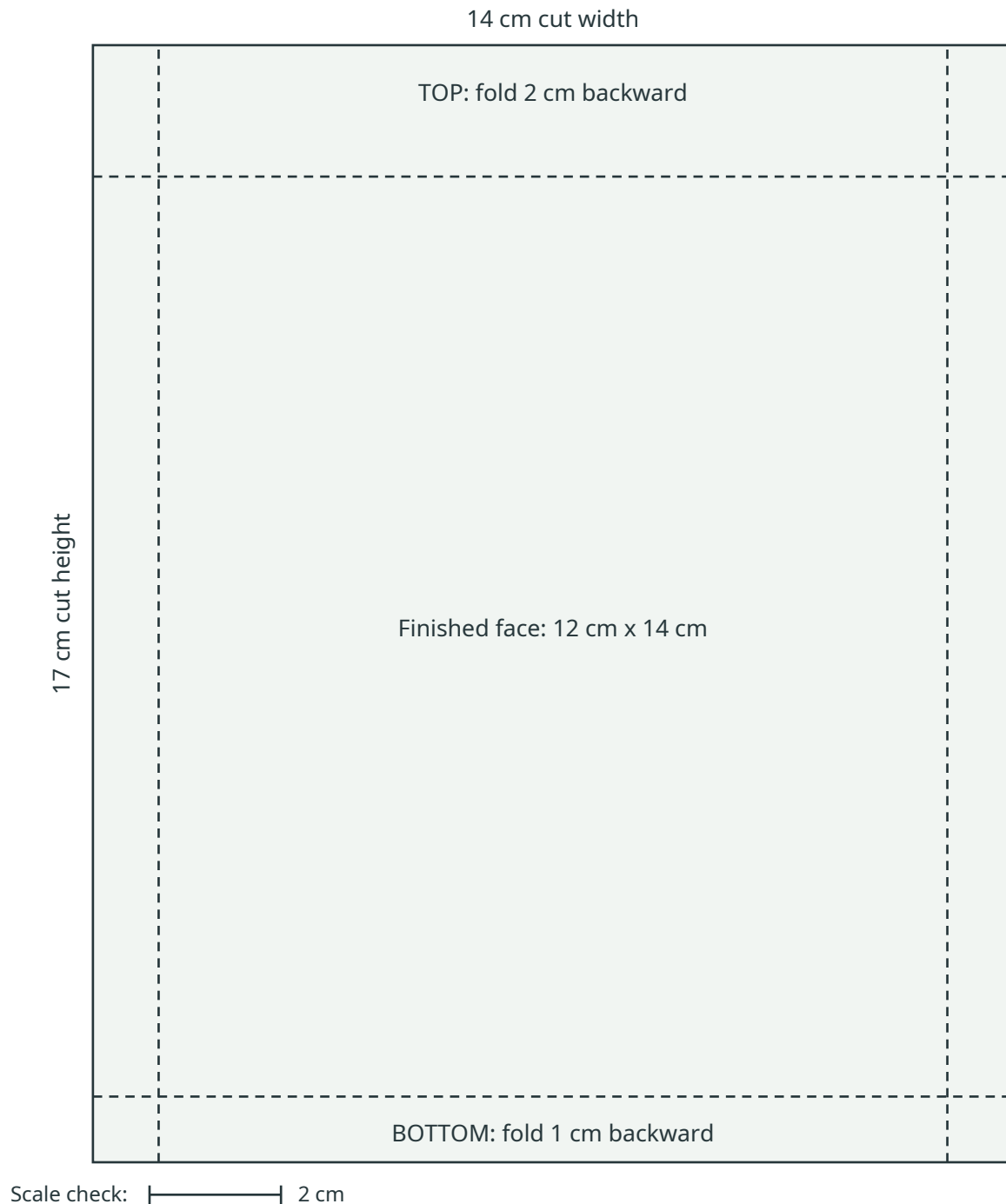
1. Use the page 7 template or draw the measured rectangle on scrap paper. Cut only the solid outside edge. 2. Fold each dashed line backward. 3. Attach the folded side and bottom tabs to a backing sheet with tape. Leave the top opening free. 4. Cut three scrap-paper cards, each 5 × 7 cm. Label them 1, 2, and 3.

Use only paper cards for testing. An adult can help with cutting or hold the paper while you fold. Keep your sketch nearby so you can compare your plan to your model.

Design note: the illustration is a rectangle-fold model, not a fabric sewing pattern.

# Cut. Fold. Test.

Cut the solid outside edge. Fold dashed lines backward. Print at 100%; the scale check must measure exactly 2 cm. Side folds are 1 cm each.



# Let the evidence help

**Q07** Put all three cards in the pocket. Lift the backing sheet upright and gently tilt it left and right five times. Try removing and replacing one card. What happened?

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**Q08** Change one feature or attachment. Predict what it will improve. Repeat the same test with the same cards. What changed in the result? If the first model worked, improve ease of use or explain a tradeoff.

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**Q09** Write or dictate a 3-4 sentence museum label: who is this for, what choice did you make, and what did your test teach you? Include one measurement.

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## Studio reflection

Finish aloud: “At first I thought... Now I would...” Keep your two sketches, calculations, and test notes with your model. These show your design thinking.

Optional challenge: predict whether a wider card would change your design. Test only if you have extra time.