

*Origami Kit*  
FOR  
DUMMIES®

by Nick Robinson



A John Wiley and Sons, Ltd, Publication



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## Origami Kit For Dummies®

Published by

**John Wiley & Sons, Ltd**

The Atrium

Southern Gate

Chichester

West Sussex

PO19 8SQ

England

E-mail (for orders and customer service enquires): [cs-books@wiley.co.uk](mailto:cs-books@wiley.co.uk)

Visit our Home Page on [www.wiley.com](http://www.wiley.com)

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British Library Cataloguing in Publication Data: A catalogue record for this book is available from the British Library

ISBN: 978-0-470-75857-1

Printed and bound in Great Britain by Clays Ltd

10 9 8 7 6 5 4 3 2 1



## *About the Author*

**Nick Robinson** has been folding paper since the early 1980s and has been a member of the British Origami Society (BOS) for over 25 years. He served on the BOS council for over 20 years, edited their bimonthly magazine for 5 years, and still maintains their website. In 2004 he was awarded the Sidney French medal — the highest award the society can offer — in recognition of his outstanding contribution to origami. Nick spent many years as a professional origami teacher, travelling around schools, libraries, youth clubs, hospitals, and art galleries, teaching origami and paper artwork. He ran sessions with people of all ages and physical abilities.

Nick has appeared on television and has fulfilled numerous commissions for magazines, television, and Internet advertising campaigns. Over 200 of his original origami creations have been published in 13 countries around the world, including a Japanese newspaper. He has submitted work to many prestigious exhibitions around the world. In 1994, Nick won three of the five categories for the International Alice in Wonderland Origami competition. He has been invited as a special guest to origami conventions in Switzerland, Germany, Italy, France, Austria, America, and Japan. Nick has written and illustrated 25 origami books, with total worldwide sales of several million. His origami website is [www.origami.me.uk](http://www.origami.me.uk).

Nick is in his very early 50s with a BA honours degree in communication studies. He lives in Sheffield, England, with his wife Alison, grown-up children Daisy and Nick, plus cats Gomez and Matilda. As a former professional musician he still performs solo improvised ambient guitar concerts. His music website is [www.looping.me.uk](http://www.looping.me.uk). When not folding paper or making music, Nick likes to watch tadpoles in his garden pond, cycle in the countryside, eat curries, make awful puns, take photographs, and generally embarrass his children.

## *Author's Acknowledgements*

This book is dedicated to my beautiful Alison, Daisy, and Nick Jnr (arguably taller than his dad now). Also to our cats Matilda and Gomez, who is 21 years old and looking every day of his age.

Special thanks to the origami designers whose models appear in this book, for their generosity in allowing me to publish their work and for offering advice and ideas.

More general thanks to Wayne Brown for friendship, proof-reading, and most importantly telling me when I'm being an arse. Origami-l and BOSmail mailing lists for ideas and feedback. Florence Temko, Robert Lang, Edwin Corrie, Eric Joisel, Dave Venables, and Dave Brill for feedback, support, and assistance. Joan Homewood, Penny

Groom, Mick Guy, and Ann Lavin for spiritual support during a recent illness. Bev, Steve, John, Rich, Chris, and Dave, my fellow band-members, for helping me to make beautiful(?) music. Roger Price for the wonderful world of doodles; The Dilshad and Shimul Indian restaurants for me spicy wittals. All at Cherry Red Records. Matt and Folding Australia for vital information about bricks. Dennis Walker for proofing, songs, and humour. Thea and Darren, the 'other' Sheffield folders. All at Charnock Health Centre, Sheffield. OUSA for the invite; sorry I couldn't make it! My other origami friends are entirely too numerous to mention, but you know who you are and I thank you!

If I've forgotten anyone (and I generally do), sincere apologies.

On the *For Dummies* side, thanks to Rachael, Wejdan, and Sarah at Wiley.

*His work is unbelievable!*

— Eric Joisel

*I can think of nobody better qualified to write this book.*

— Robert Lang

## Publisher's Acknowledgements

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# Introduction

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**I**'ve been learning and loving origami for nearly 30 years. What got me started? Buried deep within me was a desire to learn a creative art. I tried basket-weaving, macramé, and painting, but found no real empathy with those subjects. When I borrowed my first origami book from the library, I quickly realised I'd found what I was looking for. A perfect marriage of art and technique, origami enables you to turn innocent sheets of paper into little gems that you can give to other people, brightening up both your lives.

The joy of origami, the art of paper-folding, lies partly in an innate human need to fiddle with paper. You get a bus ticket and can't leave it alone. You fold it in half, form a tube, make pleats – it seems impossible not to. Fiddling about with paper is also a way of magically transforming an everyday material into a living, breathing creation. People are always amazed at the possibilities of the humble sheet of paper when you use it for origami. You don't need to be a genius or artist to make or design origami models, nor do you need an endless supply of patience. As you'll see in this book, you can make a recognisable origami model in a few seconds.

To a convert, origami is more than just folding paper – it's an expression of fundamental human values: creativity, curiosity, emotion, communication, and above all, fun!

## *About This Book*

The possible origami creations are endless, from flowers to birds, from cars to cuckoo clocks, from dung-beetles to elephants. For this book I've selected designs from a wide variety of subject areas and ordered them according to complexity. Where appropriate, I try to explain the thinking behind some of the steps, as well as the way in which origami diagrams and symbols are used to explain a three-dimensional move in what is a necessarily flat drawing. I also inject the odd note of humour; partly to avoid the accusation that origami books have to be dry, but mainly because that's the kind of guy I am and it's far too late to change.

Throughout this book, I encourage you to be creative and to experiment with the models; changing angles, distances, and so on to see what you can discover. Just because the model is called a goldfish doesn't mean you can't adapt it to become a herring or a whale.

You may feel that a particular model can be improved by a few shaping moves at the end, and this is as it should be – go ahead and make your moves! The world needs new creative folders! However, even if you feel you don't have a creative bone in your body, simply following the instructions will make everyone else think you're very talented, so don't debate the point, just show them the model and bask in the praise.

## Conventions Used in This Book

To make this book even easier to use I use a few conventions. The action parts of the numbered steps are in **bold** and the numbers correspond to the numbers in the accompanying illustrations. (Well, it would be a bit confusing if they didn't.) Web and email addresses are in `monofont`.

Most origami models are created by real live human beings and I credit them whenever appropriate. Doing so is polite, legally advisable, and it's good to associate the model with the creator's name.

Origami instruction symbols can have subtle differences. I explain the symbols I use in Chapter 1, and use them consistently throughout the book. I also include them on the cheat sheet so you can refer to them quickly and easily.

You can fold everything in this book from a standard 15-centimetre-square piece of paper (but feel free to go larger or smaller as you like). However, for the more challenging designs in Chapters 6 and 7, you may want to double this size until you're confident with the model.

What to call someone who practises origami? The terms 'origamist', 'paper-folder', 'paper-artist', 'origamian', and '*plieur de papier*' are all in use, but I prefer the first, because it's not too posh, and has right air of implied competence about it.

## Foolish Assumptions

In writing this book I couldn't help but make a few assumptions about you, dear reader. I assume that:

- ✔ You want to get to grips with the fundamentals (and more) of origami.
- ✔ You have no previous knowledge of origami and want me to take you step-by-step through all the techniques and terms you'll need to become a fully-qualified paper-folder.



✓ You may have already dipped your toe into papery water and want to discover more models to fully immerse yourself in.

Put simply, this book is for anyone remotely interested in the endless possibilities and enjoyment of origami.

## *How This Book Is Organised*

This book is divided into three parts; the need-to-know stuff, the models, and the fun tips and information at the end.

### *Part I: Coming to the Crease: Basic Techniques*

In this part I introduce you to the essential techniques and symbols you need to start folding.

I explain how to create your own models and make your own origami instructions, which can actually help you to become a better folder. In addition, you can share your efforts with the rest of the origami world and be a contributor rather than just a user. I describe a variety of techniques ranging from very low to hi-tech. I also explore origami ethics. Intrigued? It's all in Chapter 2!

### *Part II: Folding On: The Models*

This part is where you'll find 75 models to create, ranging from designs that use the simplest of techniques through to those with many separate steps. From simple and moderate models you move on to geometric and challenging designs. Don't panic – you don't need to understand *any* mathematics in order to complete the geometric models. Maths isn't one of my strong points!

Also in this part, you'll meet some origami *bases*, straightforward folding sequences common to many designs. I use simple designs within the information about bases to demonstrate the techniques.

### *Part III: The Part of Tens*

In this set of small but perfectly formed chapters you'll find a series of origami nuggets to enhance your enjoyment and skill. Discover my top ten folders, check out top tips to try, and experiment with ten different styles of origami.

## Icons Used in This Book

Scattered throughout the book are icons to help you navigate to certain key bits of information.



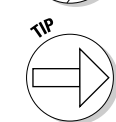
The folded paper knot draws your attention to a key point about origami to bear in mind.



This icon highlights a spot where a little more concentration or subtlety is required to make a really job of a model. As well as using in within the written instructions, I also use it occasionally within the figures.



Ouch! Avoid these potential origami pitfalls.



The target arrow highlights a particularly useful piece of advice.

## Where to Go from Here

You can dip in and out of the book as you like, but I recommend that you follow the traditional route from easier models to more difficult to build up your experience. Success with a simple design encourages you when you come to the more challenging models in the book. If you want to find a particular model or technique you can use the table of contents and the index in the back of this book.

Origami has never been a super trendy activity, and you may need to develop a forgiving attitude in case your friends scoff at your hobby, but once you've mastered a few simple designs, they'll sit back in amazement and you'll become everyone's best friend. Well, perhaps.

# Part I

# Coming to the Crease: Basic Techniques

The 5<sup>th</sup> Wave

By Rich Tennant



*In this part . . .*

**W**elcome to Part I, where I initiate you into the marvellous and mysterious techniques and symbols you need to start folding and making models.

In this part you'll also discover how to create your own models and write your own origami instructions.

## Chapter 1

# Getting Started in Origami

---

### *In This Chapter*

- ▶ Finding folding materials
  - ▶ Discovering origami symbols
- 

**M**aking an origami design, whether simple or complex, generally requires concentration and accurate folding. In order to achieve these desirable aims, you need to create the proper environment in which to fold, as well as observing a few basic guidelines about how to fold. This chapter explores the things to think about before you get stuck in to the origami models – the materials and tools you need (sometimes more than paper and hands are useful!). This chapter also introduces you to the symbols that show you what folds and creases to make, not to mention how to tell when you need to rotate the paper and apply pressure.



The following tips assume you're improving your folding skills by working on new material – clearly, after you've learned a design you can (and will) fold it anywhere!

### **Origami through the ages**

As with many ancient arts, historians don't know for certain when origami began. Paper was invented during the second century AD in China, so it's likely that's where the art of folding paper first started. Japan began to produce paper a little later and origami as we know it was developed in Japan. Used initially for ceremonial events, recreational origami grew slowly until about 150 years ago when things really took off.

The principles of creative origami were developed by Japanese masters such as Akira Yoshizawa and Kosho Uchiyama and during the 1950s, and by Westerners Robert Harbin, Gershon Legman, and Sam Randlett. They set in place the method of diagramming used today and made huge efforts to forge links between previously isolated folders in order to develop a proper community of origamists.

## *Folding Here, There, and (Nearly) Everywhere*

So where and when should you fold? When to make an origami model depends on your individual circumstances, but it's generally not a good idea to tackle a new project at 3 o'clock in the morning after a 12-hour shift. Try to find a gap in your schedule where you can devote at least half an hour to folding without having to take breaks to wash the dishes or stroke the cat.

Consider where you're going to fold. Ideally you want a large flat table with plenty of elbow-room, somewhere to spread out the instructions or book, and good lighting. Don't forget to have a waste-paper basket handy in case your first efforts get a bit mangled, and keep on hand some stress-relieving devices such as hot drinks or chocolate. Just don't keep food or drink too near your paper!

You may have seen folders holding the paper in the air and making all the creases without resting on anything. These individuals are very experienced in origami and fold in this way so that others can

### **Amazing origami facts**

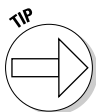
Here's a list of things you never knew about origami – save these gems for dropping into conversation at elegant dinner parties.

- ✔ The word origami has only been in use in the English language for 50 years.
- ✔ You *can* fold a piece of paper in half more than seven times.
- ✔ You can solve quadratic and cubic equations by folding paper.
- ✔ The oldest known origami book, *Hiden Senbazuru Orikata*, was written in 1797.
- ✔ The largest origami crane was 65 metres by 36 metres. The smallest was folded from a 0.25 millimetre square piece of audio tape by Akira Naito.
- ✔ The simplest origami model has only one fold, the most complex more than 200 folds.
- ✔ There are more than 200 varieties of origami elephant.
- ✔ You can make origami models from food, metal, mesh, money, and of course, paper.
- ✔ Poppadom (People Out Practising Paperfolding and Dining on Masala) is a society dedicated to folding origami while eating curry.
- ✔ Saburo Kase both created and taught origami, despite being blind.

see what they're doing. In general though, it's best to fold on a flat surface, such as a table because neat, accurate creasing is a lot easier to achieve on a table.



This may seem like obvious advice, but remember to use both hands when folding. Your hands are a partnership in origami, with one holding the paper so it doesn't move, the other creasing it.



Try to alternate the hands that you hold and crease with so that it feels natural to make a crease with either hand. Readers blessed with three or more hands will have a distinct advantage when tackling modular origami.

## *Thinking first, creasing second!*

Whenever and wherever you fold, you're always making creases. You need to put the crease in the right place at the first attempt because a crease that's been made in a sheet of paper can't be erased like a pencil line. The fibres of wood along the crease have been broken and can't be mended. Here's how to make a perfect crease:

1. Put the paper into position slowly, and take another few seconds to check the exact position of the layers or edges, checking the instructions as you do so.
2. When you're certain that everything's in order, hold the paper in place with one hand, freeing the other hand to make the crease. As with all matters dextrous, you can fold right- or left-handed, as you prefer.
3. Start the crease at the centre of the folded edge, using the pad of your finger to sweep out to first one side, then out to the other.
4. Once the crease is in place, put both fingers to the centre and run them outwards at the same time, to reinforce the crease. Think of your fingertips as an iron, putting a sharp crease into a shirt.



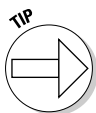
Don't start at one side and crease inwards, because you might 'ruffle' the paper, rucking it slightly like a badly fitted carpet. If you rush the process, you may have to make adjustments later on. Adjusted creases are far harder to work with and can make the finished model look sloppy.



As you progress in origami, you discover that creases don't all have to be made firmly. Sometimes a gentle or soft crease is more effective on a natural subject. Don't worry about this for now, I'll tell you when you might like to try making softer creases.

## Patience is a virtue . . . especially with origami

Patience is particular virtue worth having in the world of origami. You're bound to find a design that slightly (or greatly) exceeds your folding ability. Like any other skill, no real short-cuts exist; you simply have to persevere and give it time. Trying the most interesting and challenging projects first is always tempting, but not the best way to develop confidence.



### *Reading ahead*

When you're following origami instructions, always look at the next step, so you have an idea of what you're trying to achieve.

At times you might work out how to make your paper match the next step without really knowing how. At that point, unfold the step and try to work out how the preceding drawing tried to get you there. Read the accompanying text as well; you may have missed an instruction in the text that isn't obvious from the drawing, such as which of several overlapping layers you may need to fold.

## *What to Fold With*

You can get hold of so many different types of paper, it can be a confusing choice, but in this section I suggest some places to start. After a while, you'll be able to tell if paper is suitable simply by folding over the corner of a sheet. (If it isn't suitable, you unfold it and surreptitiously slip it back on the shelf.)

You can buy origami paper at most decent craft shops for around £2 per pack, depending on the type of paper. Origami paper usually comes in 6-inch squares, although you can buy both larger and smaller formats. For more complicated designs (such as those in Chapters 6 and 7), always fold from the largest convenient paper you have. If you need a rectangle other than of standard proportions, you'll probably need to cut it yourself.

Although paper is the obvious choice of folding material, you have many other alternatives, depending how strong you are and how much you enjoy a challenge!

✓ **Origami paper.** This paper is perfect for simple models, and a selection is included in this book. Origami paper comes in a



huge variety of colour and pattern combinations, is usually perfectly square, and often very cheap. Each pack contains a selection of colours, although you can buy packs of a single colour (such as red, when Christmas approaches). This paper has a colour or pattern on one side and is plain white on the other.

- ✔ **Duo paper.** This paper has a different colour or pattern on each side.
- ✔ **Harmony paper.** This type of origami paper has patterns made of colours fading into each other. You won't see many experienced folders using it, because it's highly decorative and may distract from the lines of the model itself.
- ✔ **Foil paper.** One side of this paper is coloured foil, the other is white paper. This used to be highly popular, but the metallic finish isn't to everyone's taste, and it's almost impossible to reverse the direction of a crease.
- ✔ **Kraft paper.** Kraft paper is usually brown and comes in huge rolls for wrapping parcels. It's brilliant for folding and you can also find it in different colours, if you look around.
- ✔ **Canson.** A high quality art paper, canson is available in a variety of colours (the same both sides). It's ideal for larger models, especially if you're wet-folding (Chapter 9 explains wet-folding in more detail).
- ✔ **Elephant hide.** This paper isn't literally made from elephants, you'll be glad to hear! It has an elegant marbled effect, and is also good for wet-folding. Elephant hide is also known as Wyndstone paper.
- ✔ **Washi.** Washi is a Japanese word meaning 'handmade paper'. It's generally thicker than normal paper and requires some experience to fold with, but can produce outstanding results that last for many years.
- ✔ **Tracing paper.** You can fold with tracing paper, but it can be quite thick, making neat creases a little harder to achieve. However, tracing paper is great for bowls and vases.
- ✔ **Photocopy paper.** This is a cheap and widely-available material for folding with. It isn't very elegant and doesn't produce very sharp creases, but is perfect for practising and experimenting with. Photocopy paper is the material of choice for making paper planes!
- ✔ **Recycled paper.** Everyone gets more than enough junk mail through the letter-box, much of which you can fold into something or other – far better and greener than simply throwing it away.

- ✔ **Money.** Because it's designed to be hard-wearing, paper currency is great for folding. Pop into your nearest bank and ask what the cheapest form of paper currency is. You can then buy 100 fresh notes from an obscure country for a few pounds. When you give people origami gifts made from money, they think very highly of you! Whole books are devoted to the subject of models made from dollar bills.
- ✔ **Napkins.** A complete genre of origami is devoted to folding napkins, which are essentially big squares. Paper napkins are quite soft, so not every model will work. Waiters at up-market restaurants always know a few designs, or you could teach them new ones!
- ✔ **Cloth.** Origami techniques are widely used in the making of clothes, often in the form of pleats, but sometimes actually using origami bases. You can make models with towels (you may have seen *towelgami* creations left on your bed by the staff on cruise ships). You'll probably need to buy a large box of starch before starting.
- ✔ **Clay.** If you want a challenge, you can make thin sheets of clay and create simple designs before firing them. You need a kiln, which adds to the overall expense. A Japanese company has invented special ceramic paper for this purpose but, trust me, this requires a deft and damp touch!
- ✔ **Pastry.** You can use filo pastry and other forms of dough to fold with, so you can make your food look interesting even if it doesn't taste wonderful!
- ✔ **Sheet metal.** Some physically gifted folders have made designs from metal. Needless to say, don't try this if you have a delicate constitution. You can use thinner sheets of silver to make beautiful origami earrings and other jewellery.
- ✔ **Tea Bags.** Tea-bag folding originated in Holland and can produce geometric designs of great beauty. You actually fold the wrappers that the bags come in, although you could always try the bag itself.
- ✔ **Tickets.** Tickets for buses, trains, concerts, as well as general business cards are great for making simple designs, especially jumping frogs (Chapter 7 shows you how to make a jumping frog). Tickets are rarely square, so you should practise designs from rectangles.
- ✔ **Netting/Mesh.** You can get your hands on small squares of a type of thin mesh aimed specifically at origamists. The mesh produces a surprisingly attractive result if you make flowers using it.

## Origami tools

All you really need to make origami models is paper and your hands (plus love, if you're a Beatles fan) but here are some tools that may enhance your folding experience. You can pick up these tools from most craft or art stores.

- ✔ **Folding tool.** A folding tool is a small strip with a rounded edge, a bit like a short chopstick. Traditionally made from bone, now plastic or wooden folding tools are widely available for a few pounds. Use them to *really* flatten creases. Some folders love them, others are more disdainful, Make up your own mind!
- ✔ **Trimmer.** An A3 rotary trimmer is perfect for preparing squares of the right size. Guillotine types are best for large sheets, but can be dangerous. If you decide to buy a trimmer, check that it cuts paper at right angles!
- ✔ **Paper storage.** Okay, storage isn't really a tool, but you need some means of storing paper to keep it flat and compact. Many suitable second-hand drawer units are out there, and you can use plastic wallets for smaller squares.
- ✔ **Model storage.** When you've made a superb model, you have four main choices about what to do with it. You can give it away (the altruistic option), display it (but most houses only have so much shelf space), throw it away (gasp), or store it. Smaller cardboard boxes that have been used for packaging are usually free from supermarkets. Put tissue paper, scrunched-up newspaper, or even polystyrene 'worms' in the box and arrange your model inside so it can't move about. The same applies in triplicate when you want to send origami through the post!
- ✔ **Cutting board and knife.** The knife isn't for cutting your models, but for preparing odd shaped paper, such as triangles or hexagons. Be *very* careful when cutting. I foolishly once cut on an old book resting on my knee, only to slide the knife off the end of the book and into my leg. Ouch.
- ✔ **Glue.** What? This is origami – no glue allowed, surely? Actually, glue is generally considered acceptable to use when preparing a model for display. You want it to stay in place under potentially adverse conditions and glue helps. Some folders use wet-folding techniques with liquid glue when folding intricate designs. The end result is as permanent as can be.
- ✔ **Digital camera.** A digital camera is perfect for making rough diagrams, keeping a gallery of your work, or capturing inspiring images from an exhibition. However, be aware that some folders don't allow their work to be photographed out of fear of piracy. You can read more about making diagrams in Chapter 2.
- ✔ **Paper clips.** At times you'll wish you had extra hands, especially when assembling modular designs. A few well-placed paper clips can be really useful.
- ✔ **Hammer.** Sometimes layers of paper simply won't lie flat. You can use a small hammer to encourage the paper to do as it's told. Careful, now!

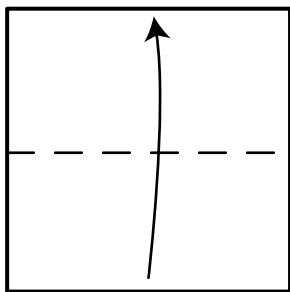


Not every design works with every medium, so experiment until the model works.

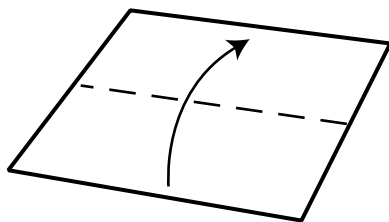
## Knowing Your Symbols

At first glance, origami diagrams can appear a bit complicated, but once you master the basic symbols, they'll soon make perfect sense to you. You see about a dozen symbols on a regular basis, plus as many again that crop up less often. People who make lots of origami diagrams sometimes come up with their own variations and additions, but in general, origami diagrams from anywhere in the world use the same basic set:

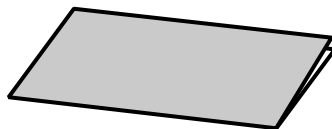
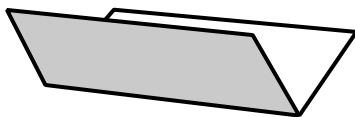
- ✓ **Valley fold.** This is the fold everyone knows how to make – it's the one you use to fold a letter in half, for example. You fold the paper over and line up the edges (or corners), then use one hand to hold the paper in position and the other to iron in the crease, starting in the centre and working outwards. The symbol is a line with an arrow head of some kind at one end. A dashed line indicates where the crease should lie. The arrow gives you the direction in which to fold.



valley fold

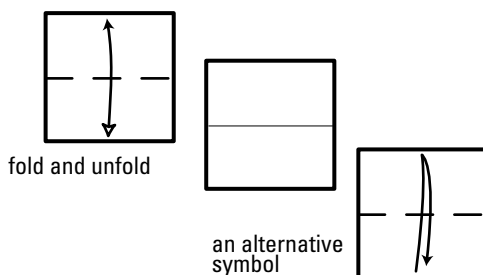


valley fold (shown in perspective)



✓ **Valley and unfold.** Here you make a fold, then unfold it. This may form a reference crease to line up with, or you may refold it later on (they're then known as *precreases*). Different symbols are in common use but in this book I use the solid and hollow arrowheads – the solid arrowhead shows the direction to fold in, the hollow one shows where the fold returns to.

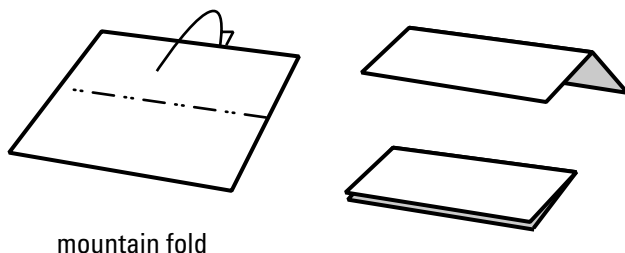
Why bother? I use this convention because for any given valley crease, you could fold paper from either side of the crease. In some cases it doesn't matter which way you fold (for example, a basic diagonal). In other cases, it's considerably *easier* to fold from a specific direction. Where there's no advantage to be gained from creasing in a certain direction, I use two solid arrowheads.



✓ **Existing crease.** When you've made a valley fold and unfolded the paper, it leaves a *crease line*, indicated by a very thin line. Crease lines are as important as edges of paper, because you use them to locate other folds.

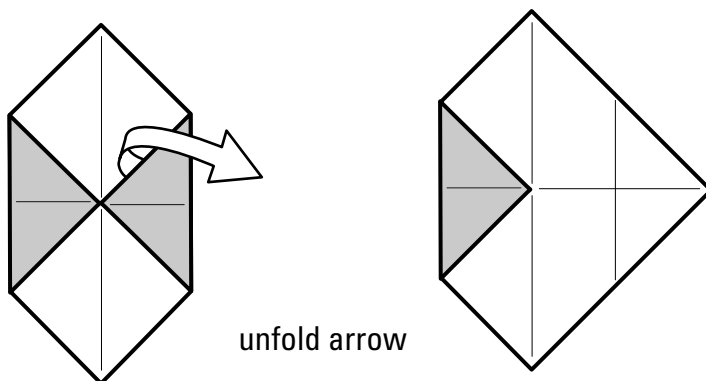
✓ **Mountain fold.** This is the opposite of a valley fold because you fold the paper underneath. You either hold the paper in the air to fold, or turn the paper over and treat it as a valley fold, remembering to turn back over afterwards so you tally with the diagrams.

Every time you make a valley fold, you make a mountain fold on the opposite side of the paper. Strictly speaking, these are the only two types of creases you can make – all the others are combinations of mountains and valleys.



mountain fold

✓ **Unfold arrow.** The arrow line disappears behind an edge and then comes back. The unfold arrow is a solid white arrow showing that you're unfolding a layer, or easing paper out from between layers.



✓ **Repeat arrow.** If a move is applied more than once, a repeat arrow means 'do the same'. If a folding line has a small line (or lines) across it, you repeat the indicated fold somewhere – it's usually obvious where, but the text should make it clear, or you can check the next drawing. If a fold line has three lines on it, you repeat the action three times, for example when folding all four corners into the centre.

The repeat arrow is used for one of two reasons: to keep the instructions simple and easy to follow, or because the artist is too lazy to draw the sequence over and over again.

The repeat arrow is also used to indicate repeating a sequence of steps, in which case it has the number of the first and last steps to be repeated alongside.

