

**GEEK
& CO.
CRAFTS!**

INSTRUCTION MANUAL

BRaiDeD SLINGSHOT



 THAMES & KOSMOS

Franckh-Kosmos Verlags-GmbH & Co. KG, Pfizerstr. 5-7, 70184 Stuttgart, Germany | +49 (0) 711 2191-0 | www.kosmos.de
Thames & Kosmos, 301 Friendship St., Providence, RI, 02903, USA | 1-800-587-2872 | www.thamesandkosmos.com
Thames & Kosmos UK Ltd, Goudhurst, Kent, TN17 2QZ, United Kingdom | 01580 212000 | www.thamesandkosmos.co.uk



SAFETY INFORMATION

WARNING.

Not suitable for children under 3 years of age. There is a risk of choking due to small parts that may be swallowed or inhaled. There is a risk of strangulation if long cords become wrapped around the neck. This kit contains sharp needles. Do not injure yourself! Never aim the slingshot at people (particularly at their face or eyes) or animals, and only use soft projectiles! There is a risk of injury if projectiles other than those included in the kit or those suggested in the manual are used. Carefully follow the step-by-step instructions (pages 10 to 12), and do not change the size or weight of the balls.

Save the packaging and instructions. They contain important information.

Dear Parents,

With this kit, your child will learn how to make a slingshot and use it in all sorts of fun games. Shooting the slingshot promotes manual skill and encourages outdoor play.

It is very important, however, to use the slingshot responsibly. Please explain to your child never to aim the slingshot at people or animals. Only soft balls may be used, such as the one supplied with the kit or the other balls recommended in the manual. In addition, the slingshot should only be used in a suitable area outside,

such as an open field, in order to avoid damage or injury. Help your child to knit the balls for shooting and check their stitches before use.

We hope you and your child have a lot of fun making and playing with the slingshot!

PART 1

BRAIDING YOUR SLINGSHOT

Weaving the slingshot band

The slingshot that you will be braiding based on these instructions is more properly known simply as a sling. It is the oldest and simplest form of slingshot. It was most likely invented 5,000 years ago on the Balearic Islands — an archipelago in the Mediterranean Sea.

You will need:

Roll of yellow cord, clothespin, measuring stick, tape, scissors



The Balearic Islands

Here's how:

1 You will need six pieces of cord, each about $3\frac{1}{2}$ meters in length. An easy technique for marking off the correct lengths is to unroll a long piece of cord and stretch it out on the floor. Then place your measuring stick next to the cord, aligning the end of the cord with the end of the stick. Measure off 1 meter and mark the cord at this point with a small piece

of tape. Next, move the measuring stick to the marked spot, measure off another meter, and so on. Once you have measured off 3 meters, measure another half a meter and cut the cord. Use this same method to cut five more sections of cord, each $3\frac{1}{2}$ meters in length.



TIP!

Measuring the pieces of cord will go a lot easier if you have a friend help you. One of you can hold the end of the cord against the end of the measuring stick, while the other pulls the cord tight and makes the marks.

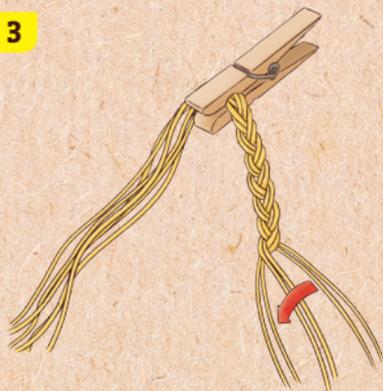
2 Next, lay the cords alongside one another on the floor. Now you have a long bundle of six pieces of cord. Fold the bundle in half in order to determine where the middle lies. Fasten the pieces of cord together in that location with the clothespin.

2



3 On one side of the clothespin, weave a braid 8 cm in length. To do that, divide the six cords into three pairs and pass the left and then the right pair in alternation over the center one.

3



4 Now you can remove the clothespin and shape the braid into a loop. Later on, you will be sticking your finger through this loop. At the lower end of the loop, there will be twelve cords hanging down. Divide them into three bundles of four cords each.

4



5 Continue weaving the three bundles. The resulting braid will be

twice as thick as the braid for the loop. Keep weaving until the thick braid is 50 cm long.

5



- 6 Now divide the twelve cords into two bundles of six cords each. Divide each of these two bundles into three pairs of cords, and weave them into a braid 12 cm in length. This is the part into which you will be sewing the ball pouch.

6



- 7 When both braids have the right length, guide all of the cords back together again. Now, you will again be forming three bundles of four cords each and weaving another thick braid 65 cm in length. This second section will have to be a little longer than the first one, in order for you to be able to hold the end tight when you use it as a slingshot later on.

7



8

- 8 When you have finished weaving your braid, tie a secure knot and cut off the excess cords at the end.



Sewing on the pouch for the ball

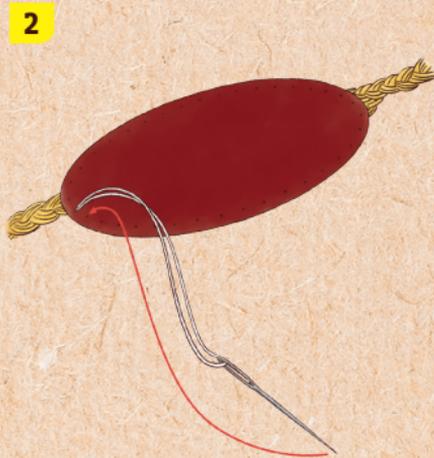
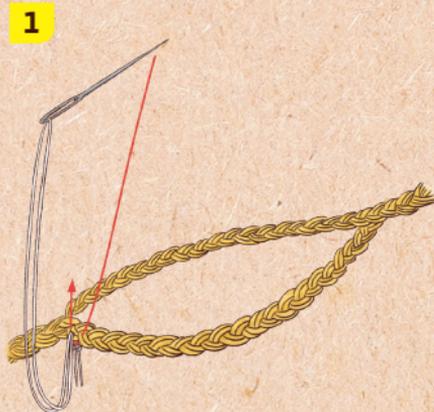
Now you will be using a so-called running stitch or basting stitch to sew the piece of artificial leather (included in the kit) to the sling. The job of the pouch is to hold the ball securely in the sling. The piece of leather has little pre-punched holes to make it easier to sew on. A line of running stitches resembles a dashed line. It is the easiest stitch to learn.

You will need:

Your half-finished sling, artificial leather piece, needle, thread, measuring stick, scissors

Here's how:

- 1 Cut a piece of thread about 60 cm in length. Thread it through the eye of the needle so a double piece of thread is hanging from the needle. Tie a fat knot at the end of the doubled thread. Pull the needle several times through the section of the braided cord where you are going to start sewing. That will secure the thread in place there.
- 2 Next, poke the needle through the first hole in the leather from below, and pull the thread through.



3 Now guide the needle and thread through the second hole and through the braided cord again. Continue sewing in this manner, inserting the needle from above and below in alternation and pulling the thread tight each time. Always use the pre-punched holes. This will ensure that the seam is nice and straight.

4 Once you have sewn on the pouch, finish by burying the thread on the rear side of the cord. To do that, make a few stitches in one spot, pulling the thread through the loop you create each time. Now your homemade sling is done.



Braiding makes ropes stronger?

Braiding makes ropes stronger than their individual strands because of the friction between the strands. Forces are distributed between all the individual fibers in a braided strand, decreasing the force any one fiber has to take on its own, and reducing the likelihood of the fiber snapping. Braiding also gives a rope elasticity, or springiness, which allows it to absorb stronger forces, rather than snapping.

PART 2

LEARNING TO SHOOT

How to use the slingshot

For practicing, find an open field where you will have a lot of room. It is also important to find a place where no people or animals are nearby. Always use soft balls so that you don't injure yourself or anyone else.

You will need:

Your completed slingshot, yellow softball, open area for practicing

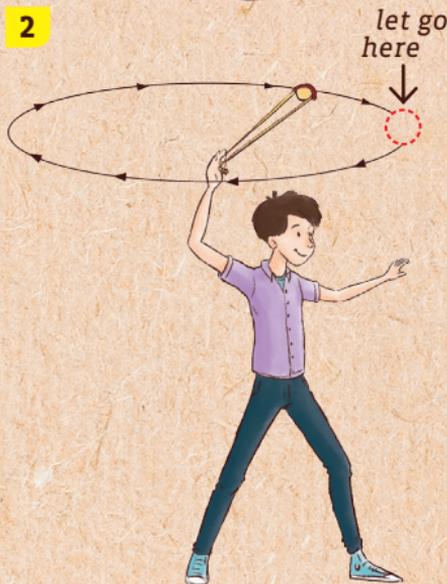
Here's how:

- 1 Take the little loop that you made at the beginning and hang it over your right index finger. Your palm should be turned up. Take the other end of the sling in your right hand in such a way that the pouch for the

1



2



ball hangs nice and straight with the back side of the pouch facing upward. Place the ball in the pouch with your other hand.

3



- 2 Position your left leg a little bit forward and turn to your right until your back is parallel to the direction that you want to shoot the ball. Swing the sling once or twice above your head in a clockwise direction, and then let go of the end without the loop in one quick motion. The ball will fly off in a high arc.

- 3 Instead of swinging the sling above your head, you can also try swinging it in a circle alongside your body.

TIP!



If you are left-handed, do everything in reverse — take the sling in your left hand, position your right leg forwards and swing the sling in a counter-clockwise direction!

Throwing the ball with the sling takes a little practice, and you will need some time before everything comes off just right. When you start, it's best to concentrate just on shooting the ball. After you are a little more confident with your sling, you can try to aim the ball at an object — a tree or a wall, for example. You will see how it gets easier, and your hit rate will rise!

PART 3

FUN THROWING GaMES

Sewing softballs

1

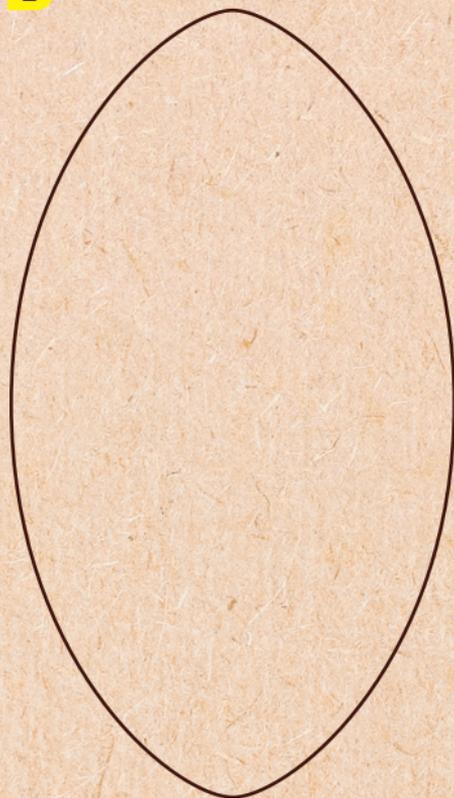
If you want to have some fun competing against your friends in a slingshot contest, you will need a few more projectiles. You can make them easily!

You will need:

Thread, needle, wax paper, pencil, fabric scraps, scissors, measuring stick, pins, millet seeds, funnel, old nylon sock

Here's how:

- 1 First, trace the pattern onto your wax paper and cut out the tracing to make a template. Place the template on the fabric and draw around the edge with a soft pencil. Cut out the resulting shape. You will need four such fabric pieces for each ball.

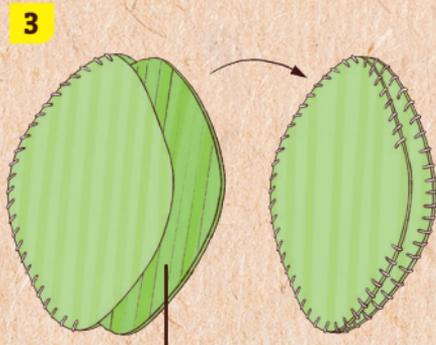
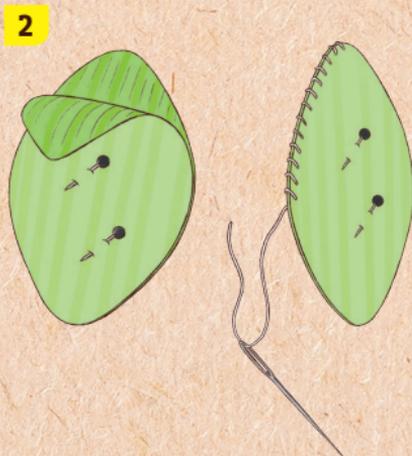
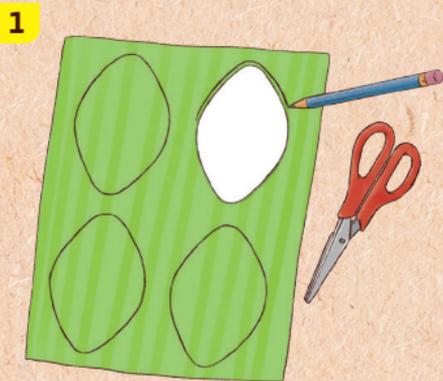


Pattern

- 2** Lay two pairs of fabric pieces on top of one another with the pretty sides facing in, stick them together with pins, and sew them together along **one edge**. Start by threading a 40-cm piece of thread through the needle and tie a fat knot at the end.

Insert the needle through both fabric pieces from the front, and pull the thread through. Now, right next to that spot, insert the needle from the front again in such a way that the thread wraps around the edge, but not too tight. Continue like this. Finally, bury the thread. You have now sewn two little “pockets.”

- 3** Turn one of the two pockets inside out, so the pretty side is now facing out. Insert that pocket into the other pocket, and sew the two open edges closed. Leave the final seam half open. Turn the ball through the opening.



pocket turned inside out

4 As a test to find out how much you will need, use the funnel to pour the millet seeds into the opening. Then pour the seeds into the sock and close it with a knot. Cut off the remaining excess sock.

Then, insert the filled sock into the opening of the ball. This way, you can be sure that no seeds will fall out. Finally, sew the opening shut. Your ball is done!

4



HIT THE CANS

You can use your homemade sling to play fun games with your friends. How about a slingshot Olympiad?

You will need:

Three home-sewn balls, 10 empty and clean food cans, colorful paper, glue stick, felt-tip markers

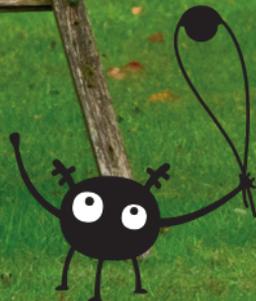


NOTE!

Do not use any cans that have sharp edges! Use a can opener that bends the edge up rather than cutting it. As an alternative, you can cover any sharp edges with fabric tape or duct tape.

Have an adult help you!

Off you go! Draw your
multicolored target pattern
in the blank area!



Making a circular target

Before you start, try drawing a colored sketch of the target on page 14!

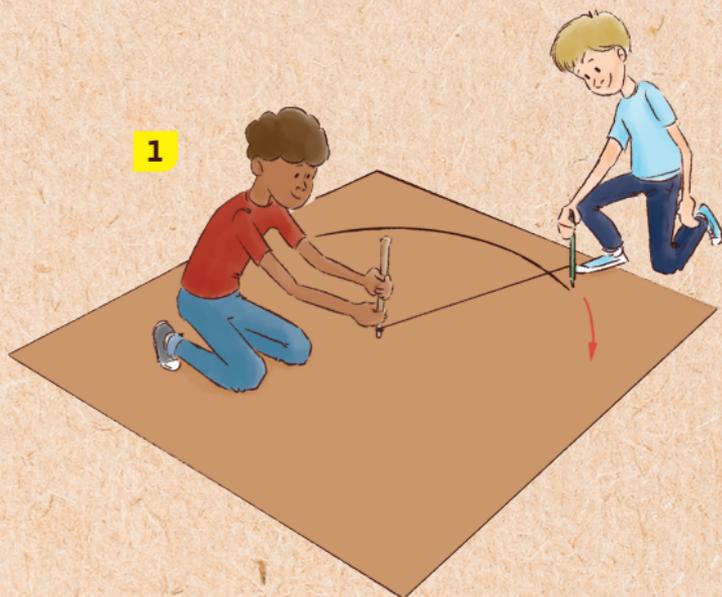
You will need:

Your slingshot, 3 home-sewn balls, cord, large piece of cardboard, stick, measuring stick, scissors, pencil, friend, colored pencils or crayons

Here's how:

- 1 Draw a circle with a diameter of about 1 meter on the cardboard. You can use a homemade compass for this: Mark the center of the cardboard, cut a piece of cord 60 cm long, and tie one end

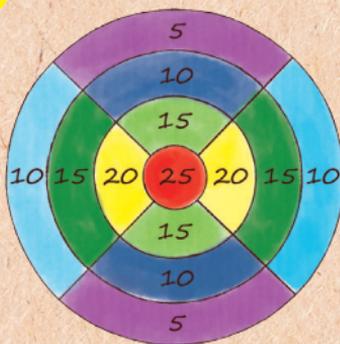
to a stick and the other to a pencil. Have a friend hold the stick in place in the center of the cardboard. Stretch the cord tight and draw a circle around the stick.



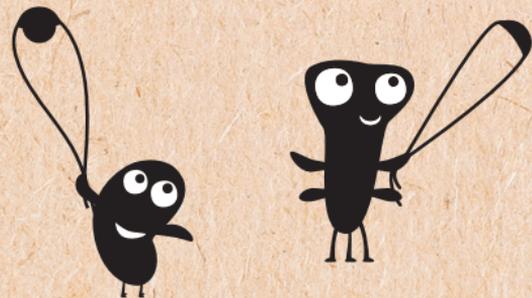
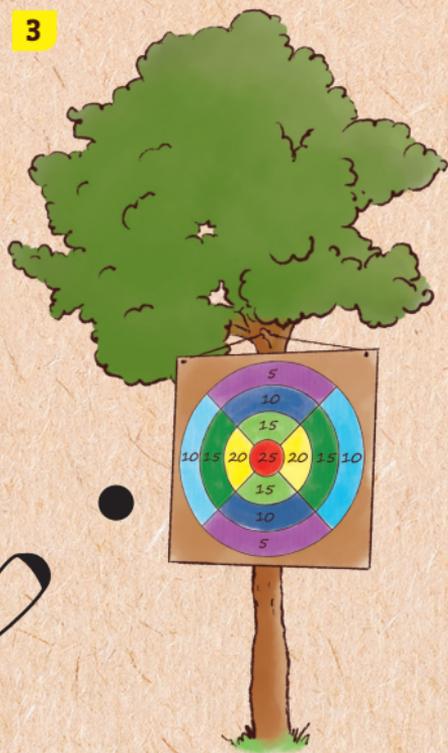
2 Draw two or more smaller circles inside the outer circle. (Simply shorten the cord.) Fill the spaces between the circle lines with point allocations. The highest point total, of course, goes in the center. Now you can decorate your target however you like with colored pencils or crayons.

3 Tie the target disk to a tree or a wall, and let the contest begin. Start by marking a throwing line on the ground. Stand some distance away and try to hit the target with the sling. It will be pretty hard at first. Each player gets three tries. Whoever has the most points at the end is the winner.

2



3





Kosmos Quality and Safety

More than one hundred years of expertise in publishing science experiment kits stand behind every product that bears the Kosmos name. Kosmos experiment kits are designed by an experienced team of specialists and tested with the utmost care during development and production. With regard to product safety, these experiment kits follow European and US safety standards, as well as our own refined proprietary safety guidelines. By working closely with our manufacturing partners and safety testing labs, we are able to control all stages of production. While the majority of our products are made in Germany, all of our products, regardless of origin, follow the same rigid quality standards.

1st Edition 2014

© 2014 Franckh-Kosmos Verlags-GmbH & Co. KG

This work, including all its parts, is copyright protected. Any use outside the specific limits of the copyright law without the consent of the publisher is prohibited and punishable by law. This applies specifically to reproductions, translations, micro-filming, and storage and processing in electronic systems and networks. We do not guarantee that all material in this work is free from copyright or other protection.

Idea and concept: Andrea Kern

Project management and editing: Kristin Albert

Text: Christine Kröhnert

Technical product development: Elena Ryvkin

Manual layout: Michaela Kienle, Fine Tuning, Dürmentingen

Manual illustrations and photos: artenot, p. 9 center right, 14 top right, bottom center; Pawel Kazmierczak, p. 2 center right; Patryk Kosmider, p. 14 (background, all previous © shutterstock.com); artenot, cover center (creature), bottom right, p. 1 bottom right, 3 bottom right, 12 center right, 13 top right, 14 bottom right, 16 bottom left, bottom center (© shutterstock.com, edited by Michaela Kienle); Michael Flaig, Pro-Studios, Stuttgart, cover center (slingshot), p. 1 top center; Matthias Kaiser, Stuttgart, p. 7 center right; Bianca Meier, Hamburg (all experiment illustrations)

Packaging design concept: Peter Schmidt Group GmbH, Hamburg

Packaging layout: Michaela Kienle, Fine Tuning, Dürmentingen

Packaging illustrations and photos: Gemenacom (Polaroid frame); Seregam (tape) (both © shutterstock.com); artenot (creature with paintbrush, © shutterstock.com, edited); artenot (all other creatures, © shutterstock.com, edited by Michaela Kienle); Michael Flaig, Pro-Studios, Stuttgart (title image, materials); Matthias Kaiser, Stuttgart (Polaroids)

The publisher has made every effort to locate the holders of image rights for all of the photos used. If in any individual cases any holders of image rights have not been acknowledged, they are asked to provide evidence to the publisher of their image rights so that they may be paid an image fee in line with the industry standard.

1st English Edition © 2014 Thames & Kosmos, LLC, Providence, RI, USA
Thames & Kosmos® is a registered trademark of Thames & Kosmos, LLC.

Editing: Ted McGuire; Additional Graphics and Layout: Dan Freitas, Ashley Greenleaf

Distributed in North America by Thames & Kosmos, LLC. Providence, RI 02903
Phone: 800-587-2872; Email: support@thamesandkosmos.com

We reserve the right to make technical changes.

Printed in Germany / Imprimé en Allemagne