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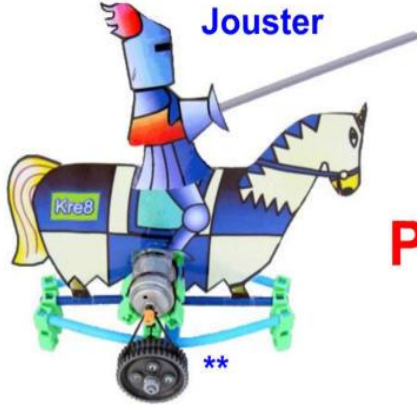
Soccer player is supplied  
but other tops can be  
made using  
ideas provided  
here

## Keywords

Wheels, axles, pulleys, robots, control, power, voltage, balance, friction, ICT, loose fit, tight fit, frame, laminate, chassis, reversing switch.

## Tasks


Make the basic frame that is common to all the POP robots using these instructions and use the footballer top provided or you can instead add one of the other tops supplied below or design your own using these ideas to help you.



**Jouster**


\*\*

Possible  
POP Robots




**Soccer player**

\*




**Dance robot**

\*



**Steerable Car**

\*\*



**Dino**

\*

\* easiest to make    \*\* harder to make

## Extra Challenges

- a) Organise a game or competition using your robot
- b) Make improvements after testing and using it.
- c) You could even control it using a computer with a computer control interface.

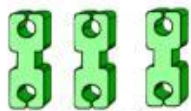
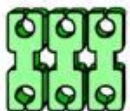
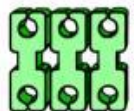
# Parts for Kre8<sup>®</sup> 'Pop' Robot

Tip - Visit [www.kre8.com](http://www.kre8.com) for movies and other support

Also on  
**You Tube**



1 x clip connectors



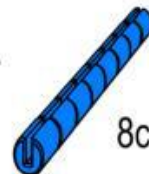
only cut up three

5 x Multiblocks (green) - **IMPORTANT** - Keep **FOUR** of the blocks uncut as supplied

Trim all sharp edges  
after cutting



1 x 3.9mm dia.



1/2 blue 5mm snap rod

**Kre8<sup>®</sup> Manual Controller**  
and  
**ribbon cable**

There is help on 'Connecting Up' the Kre8 Manual Controller on Kre8 website



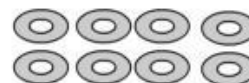
1 x dark blue tube 5mm dia x 200mm long



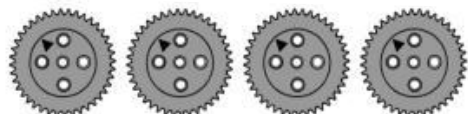
5 x light blue tube 5mm dia x 200mm long



1 x 4mm dia, snap rod  
160mm long - dark grey



10 x 4mm steel washers



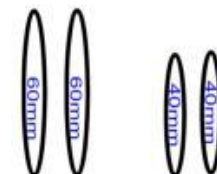
4 x 40mm dia. wheels (used to make the pulley wheels)



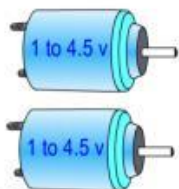
2 x 5mm dia. bendy dayglow tube



2 x 5mm blue collars

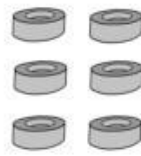


2 x 60mm and 2 x 40mm  
long rubber elastic bands



2 x Small motors 1.5V to 4.5 volts

Abrasive paper



6 x 4mm  
grey collars



Default  
top

laminated TOP

## Easy Assembly

The rods are easier to insert into the connectors if twisted as they are pushed into place. Younger students should 'round off' and smooth the tube and rod ends before pushing into holes.

## Tools

**Snips (or wire cutters and string sharp scissors)**

Use to cut Kre8 connector hinges, plastic sheet, light blue tubing (the serrated blades are better than smooth blades).



**Emery Cloth**

Assembly is easier if you use fine 'emery cloth' or other 'abrasive paper' to round and smooth the slit rod or blue tube ends.

Abrasive paper

**Pencil and Rule**

Use to mark lengths of blue tube or slit rods before cutting. Can also be used on plastic sheet before shapes are cut out. (FREE rule at bottom of page)



**4mm dia. Drill** Just in case the pulley wheel is too tight.

**DRILL SAFETY**

Keep hands away from sharp edge when drilling



**OTHER** - Clear tape, paper punch and small, Glue stick (possible), screwdriver for the Kre8 manual controller.

**HELP**  
More support on the  
**Kre8.com website**

# 1 - How to make the Kre8<sup>®</sup> 'Pop' Robot Frame

Tip - Visit [www.kre8.com](http://www.kre8.com) for movies and other support pages

Also on  
YouTube

## To Make

Follow the 'step-by-step' instructions provided and adapt as you want.

### NOTES Metric sizes

- (1) **Only** cut the **connectors** up when needed.
- (2) Use a **ruler** for measuring.
- (3) **For easier assembly** - smooth and round the tube ends with abrasive paper then push and twist the rods into the connectors.

1

**FRAME**

200mm

Tip - Round the tube ends first so they enter the connectors easier

Select two of the **200mm long light blue tubes** (a) then slide two individual **green connectors**(b)

2

Triple Block Hinge **MUST** be on outside

Push a triple green multiblock (a) onto the end of the **light blue tubes**

3

HINGE this end

Push a second triple multiblock (a) onto the other end of the light blue tubes(b)

4

Add a stiffer **dark blue tube 195mm** long in the centre. Note - The ends of the light blue tubes will **stick out**.

5

**Start Making MOTOR HOLDER**

45mm

round ends

Cut a **45mm long light blue tube** then slide a **single green connector** along it.

6

- 1) Add **two triple green connector** on the ends of the **light blue tube**.
- 2) Bend connectors **UPWARDS** as shown.

7

**'Snap' Off Pieces**

2cm

Snap off **two units** (20mm or 2cm) from the **blue 'snap off' rod**.

Tip - Use a green connector to hold 'blue snap off rod' when snapping off as shown.

8

Place the two short pieces just made (a) into the end center holes of the green connector.

9

Pull the sides outwards while adding motor holder

Fix the motor holder assembly in place onto the frame by pushing the 5mm blue snap pieces in place.

10

45mm

detail showing tube in place

Cut two 45mm long blue tube then push them in the centre holes of the green connector

**NOTE** - Temporarily move the other rod sharing the same hole out of the way.

11

hook over

Place motors as shown then use a short rubber band (a) to loop over them and hold in place.

**Continued ....**

# 2 - How to make the Kre8<sup>®</sup> 'Pop' Robot Frame

Tip - Visit [www.kre8.com](http://www.kre8.com) for videos and other support pages

12

5mm

Push two 5mm long pieces of orange dayglow tubes(a) on the motor ends.

13

See next steps to help you.

**Adding Wheels** - after looking at next step

14

### Making the PULLEY WHEELS

Leave 'centre hole' empty

'V' pulley groove X2

Steps

- (1) Push the 'grey snap rod' into the outer holes then
- (2) snap off 1cm long snap rods by bending over.

Make by joining two wheels so they form a 'V' groove.

15

### Important

Check the wheels 'spin' on the axle if not redrill wheel hole 4mm.

SPIN testing

**SAFETY** If the axle hole needs enlarging, redrill over a block of wood NOT into your hand.

16

Assembly of the pulley wheels on the axle

120mm

3.9mm

'V' groove must be in centre

This drawing shows how to assemble the 'pulley wheels' onto the 3.9mm light grey tube (a) adding 3 metal washers (b) and 2 grey collars (c).

17

ADD DRIVE

Add the rubber band drive (a) from motor pulley to pulley wheels.

18

100mm

Insert the upright tube(a) 100mm long

for football only

60

recommended extra - Add 60mm long spacer tube. (Bend the 'long slit rod' down a little to add)

19

TOP piece

Before adding the added TOP piece - e.g. footballer (shown in outline) follow instruction on the TOP piece then slide it down the upright tube.

20

### Ribbon Cable

The ribbon cable can be hidden by passing it through the 'TOP' on its way to the electric motors.

**Use of clear TAPE**

- When the cable has been added the wire can be taped to the vertical rod to stop the wires being pulled off the motors.
- When all is correct the TOP part can be taped to the long blue slit rod.

21

### Adding the Ribbon Cable

See separate PDF about Manual Controller from Kre8.com

**Note**

Ensure the ribbon cable is passed through the TOP used BEFORE wires are all joined up.

22

22

23

### Dancer

(more versions provided on website) or you can design your own top if you prefer

23

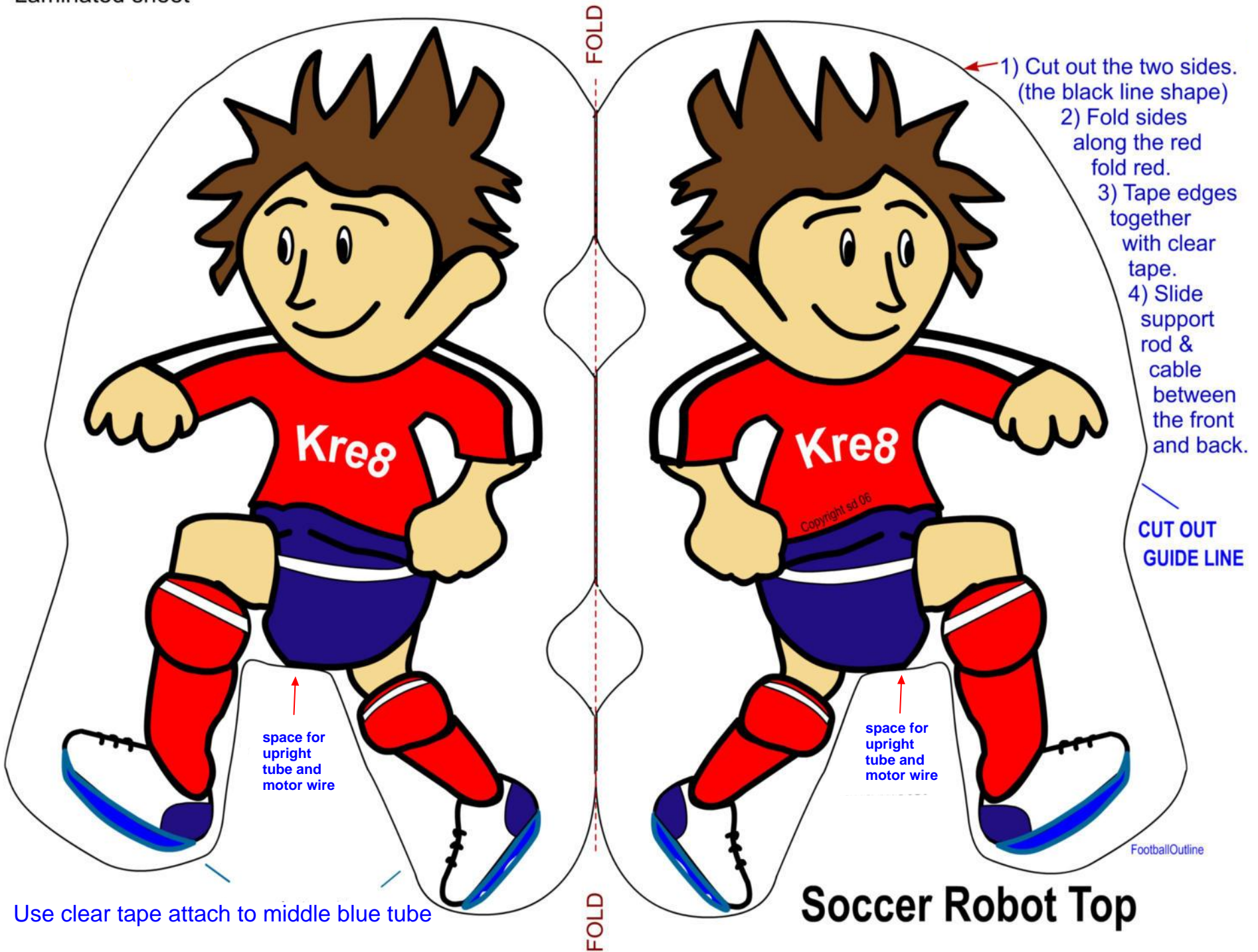
### Footballer

About to 'kick' a 'table tennis' ball

\* Rods added for football use

Laminated sheet

See the handout called 'Making your Kre8 POP Robot Tops' for other details



Use clear tape attach to middle blue tube

## Soccer Robot Top

Examples organised by difficulty using the ready-made handouts provided on the web.

The ready-made printouts are on the Kre8 website under **Robots > 'POP Robot Tops'**

## Design and make your own

Instead of making the models shown, you can design and make your own robot by adding your own top variation.



**Dancer** - Easy to make



**Dino** - Easy to make



**Mars Rover** - Medium difficulty  
A similar kit - see separate Mars Rover details



**Footballer** - Fairly Easy  
requires (ping pong or similar ball)



**Jousting** - Fairly Easy  
but requires accurate cutting out



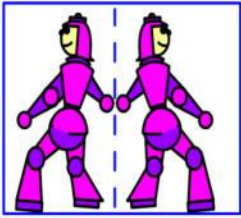
**Car** - Medium difficulty  
Note - Best to get the top plastic laminated then the top parts can be joined using clear adhesive tape

## Ideas

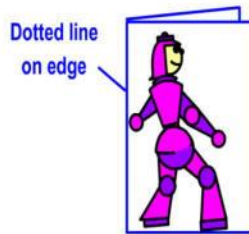
- Sports
- Animals
- Name
- Logos
- Games
- Future robots
- TV characters
- Historic people
- Racing

### How to (Plastic) Laminate your Printout Top (web printout)

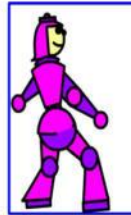
If you do not have a laminator, borrow one from your resource centre or ask them to do the following for you.



(1) Choose your design (selected from the website) or design your own.



(2) Carefully fold paper in half along the dotted line.

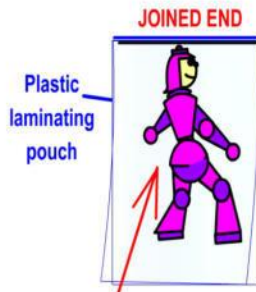


(3) Hold edges together - to stop pages moving about when being cut.

**Glue edges only**

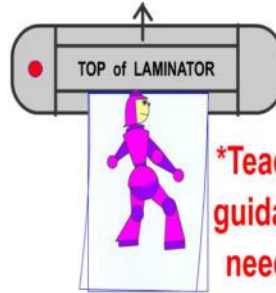


(4) Cut out the front and back parts together.



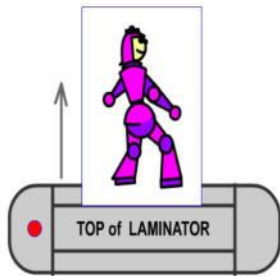
(5) Carefully insert your paper shape into the top end of the laminating pouch.

\* see **IMPORTANT** note at the bottom of page

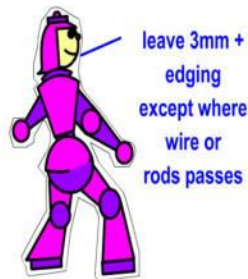


(6) Turn on laminator - When hot enough insert your pouch (light comes on).

\***Teacher guidance needed**



(7) When cool remove



(8) Cut out shape



(9) open inside then place on your vertical robot rod

### If you prefer to Design your own POP Robot Top

Using the following method to ensure your design will fit your model

1) Fold a piece of A4 paper in half. Design your idea on one side (use pencil to start with) then check it against the **'Full Size Guide'** below to make sure it fits properly (adjust or redo if too small).

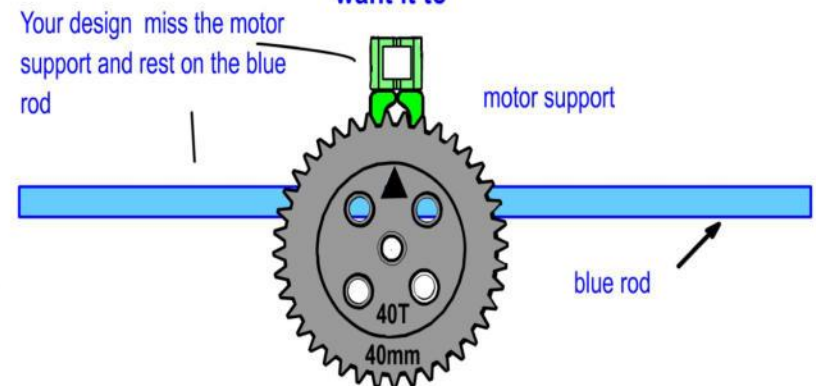


2) Cut both sides together (edges can be glue stuck while cutting out your design).



3) Decorate the front and back of your design, then go to step (5) of 'How to Laminate your Top' opposite.

**Place your design here to check it fits as you want it to**





# Dancing Robot Top

See the handout called 'Making your Kre8 POP Robot Tops' for details

Shedanving

## Card Version

- (1) Fold along the dotted line
- (2) Cut out the shape
- (3) Place the support tube and cable through the centre
- (4) Glue the two sides together

FOLD LINE

## Laminating Version

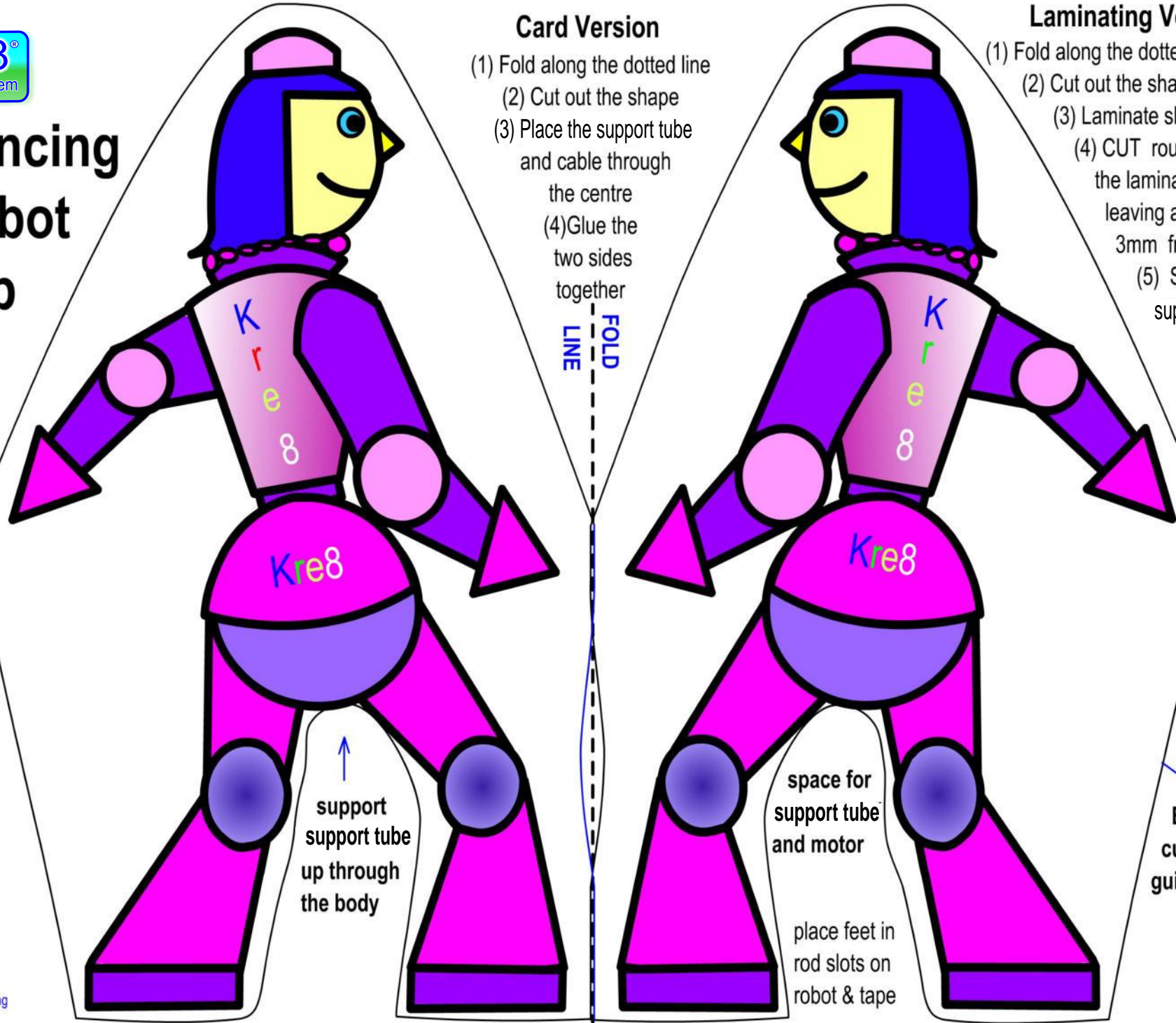
- (1) Fold along the dotted line
- (2) Cut out the shape
- (3) Laminate shape
- (4) CUT round the laminate leaving about 3mm free
- (5) Slide in support tube and cable between the front and back

Easy cut out guideline

↑ support support tube up through the body

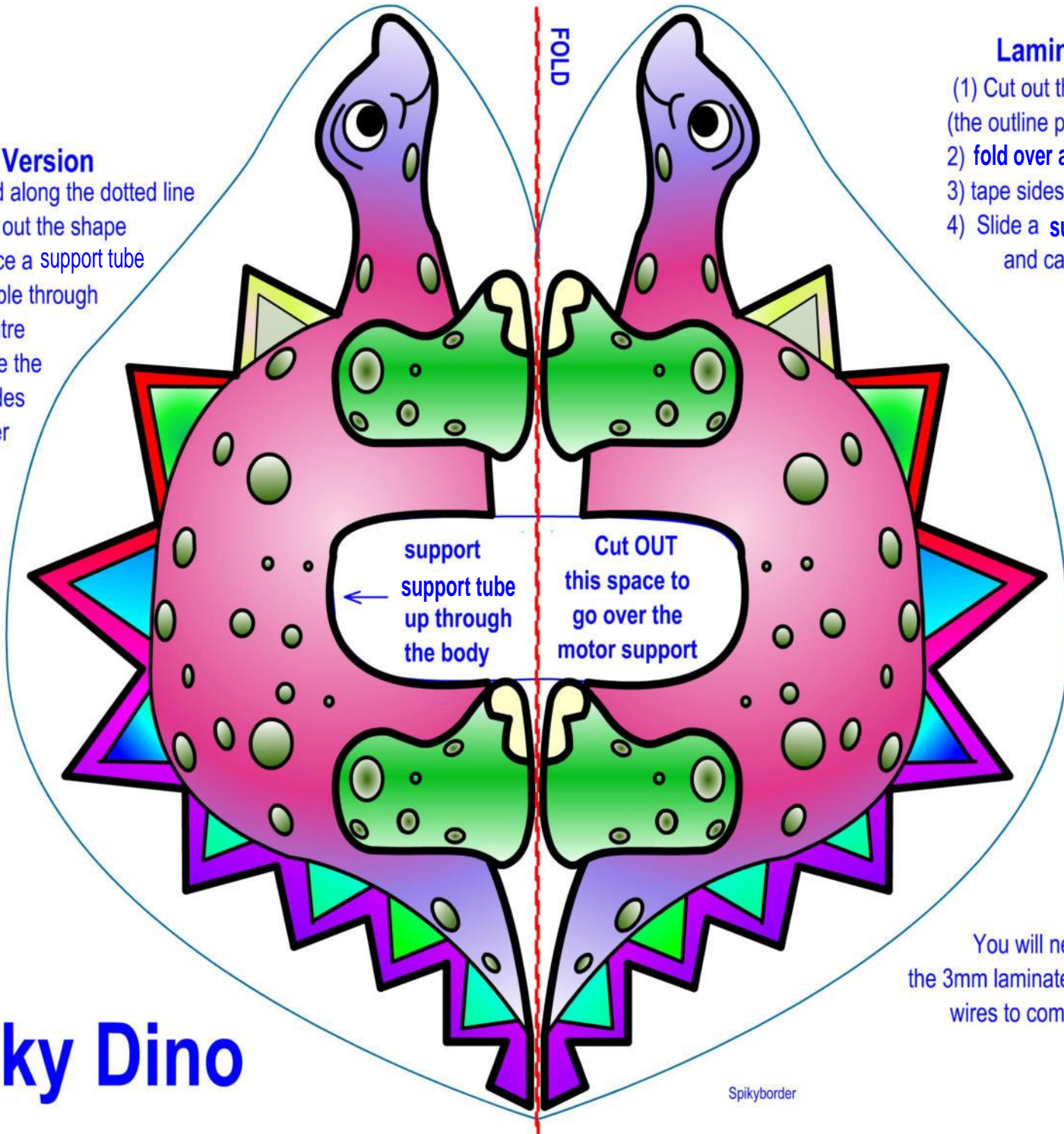
space for support tube and motor

place feet in rod slots on robot & tape



### Card Version

- (1) Fold along the dotted line
- (2) Cut out the shape
- (3) Place a support tube and cable through the centre
- (4) Glue the two sides together



### Laminating Version

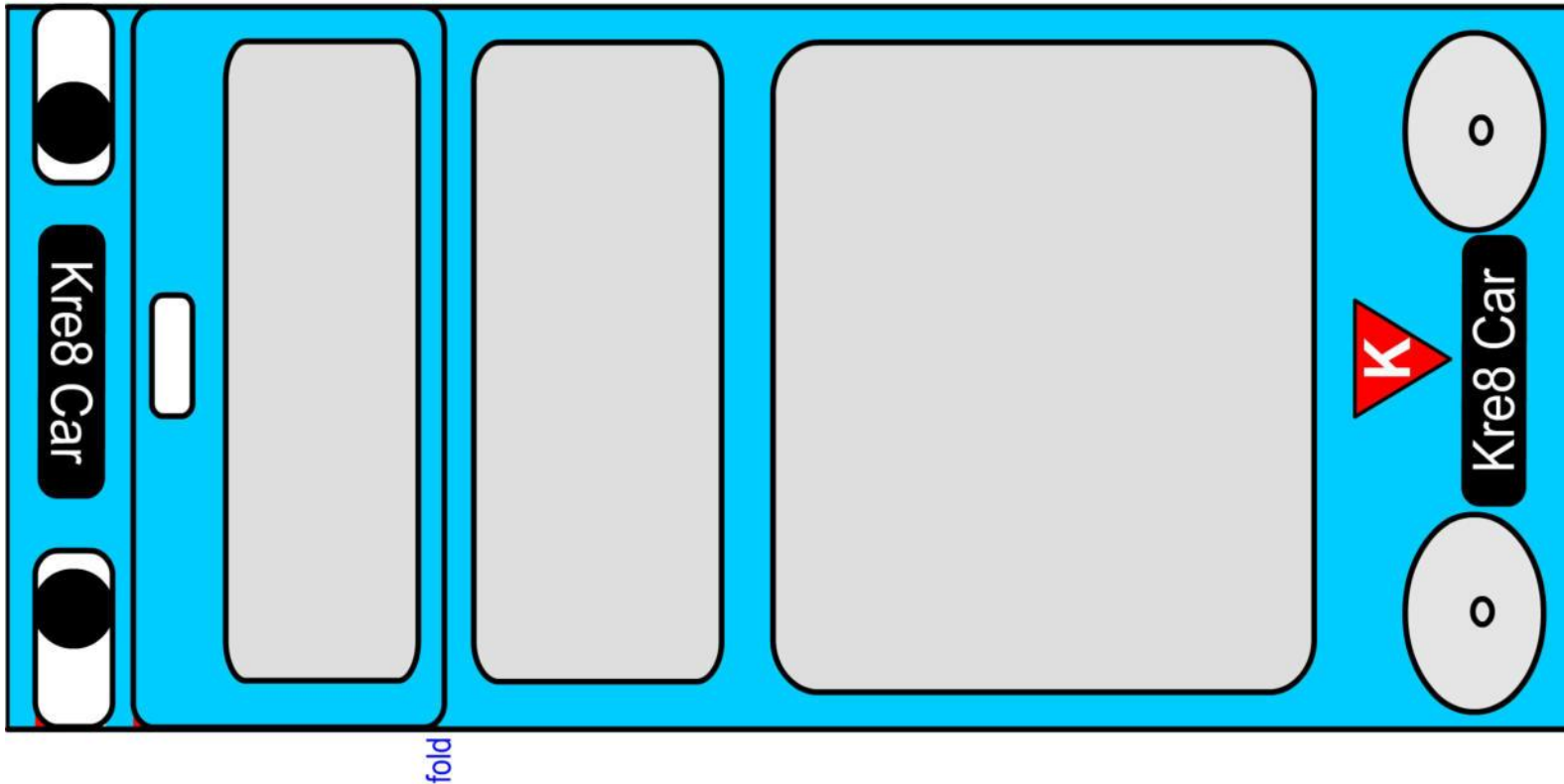
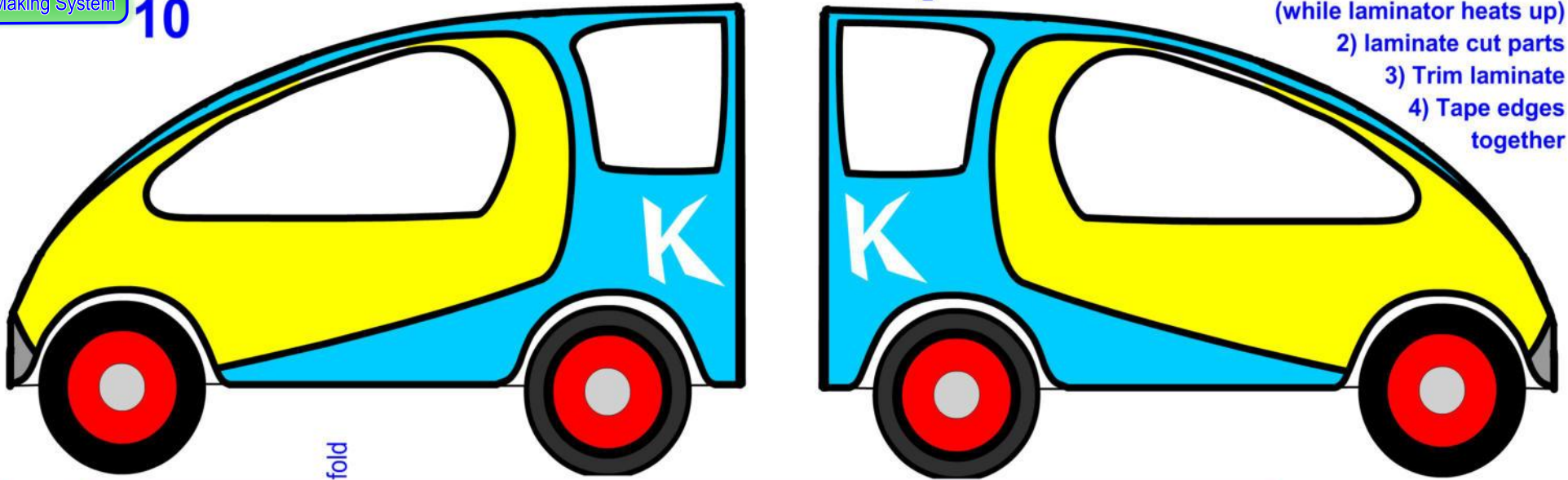
- (1) Cut out the shapes (the outline part)
- 2) **fold over along the red line**
- 3) tape sides - clear tape
- 4) Slide a **support tube** and cabl **between** the front and back

# Spiky Dino

Note  
You will need to remove the 3mm laminate to allow the wires to come through top.

# Car Top

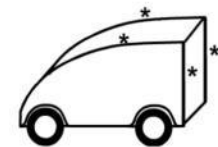
- If self Laminating
- 1) Cut parts out.  
(while laminator heats up)
  - 2) laminate cut parts
  - 3) Trim laminate
  - 4) Tape edges together

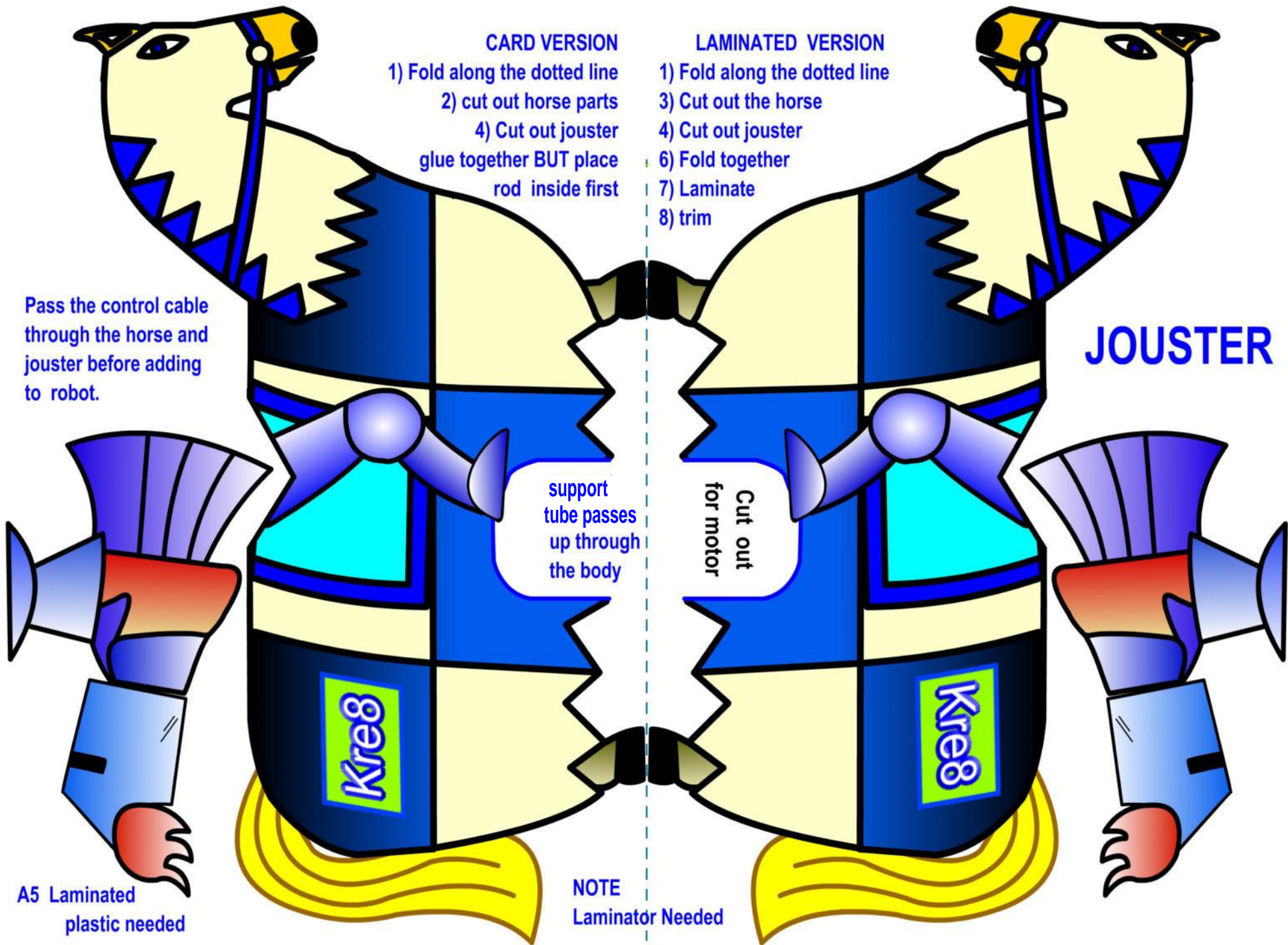


**Pre - Laminated Version**  
\*\*\*\*\*

- 1) Cut parts out.
- 2) Tape edges together.

OR  
join edges \*  
using old cards pieces  
to make 'glue tabs'  
and glue on the inside  
using hot or cold glue.





### CARD VERSION

- 1) Fold along the dotted line
- 2) cut out horse parts
- 4) Cut out jouster  
glue together BUT place  
rod inside first

### LAMINATED VERSION

- 1) Fold along the dotted line
- 3) Cut out the horse
- 4) Cut out jouster
- 6) Fold together
- 7) Laminate
- 8) trim

Pass the control cable through the horse and jouster before adding to robot.

support tube passes up through the body

Cut out for motor

# JOUSTER

NOTE  
Laminator Needed

A5 Laminated plastic needed

# Space Alian

- (1) Fold along the dotted line
- (2) Cut out the shape
- (3) Place on the robot support rod (and place ribbon cable through the centre)
- (4) Glue the two sides together after testing.

## Pre-laminated Version

- 1) Cut out sides (along outer lines)
- 2) tapes sides together (clear tape)
- 3) Place rod and wire in centre

