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## Keywords

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

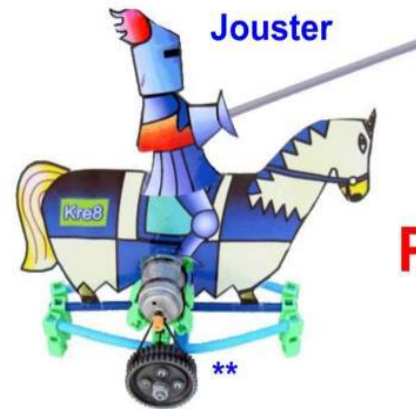
## Tasks

Make the basic frame that is common to all the POP robots using these instructions.

While doing this, decide which robot top you want and cut it out laminate ready for use later.

**Note - If possible borrow a plastic laminator to make your top look better**

**Soccer player is standard but other tops can be used**



Joust

\*\*



Dance robot

\*

## Possible POP Robots

Soccer player



\*

Steerable Car



\*\*

Dino



\*

\* easiest to make

\*\* harder to make

## Extra Challenges

- Organise a game or competition using your robot
- Make improvements after testing and using it.
- You could even control it using a computer instead of the hand controller (e.g. using the IQ Controller from Rapid)

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

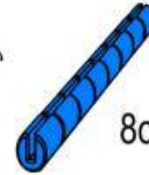


1 x clip connectors

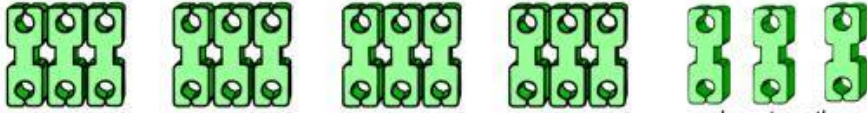
Trim all sharp edges after cutting



1 x 3.9mm dia. 200mm light grey



8cm  
1/2 blue 5mm snap rod



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

only cut up three

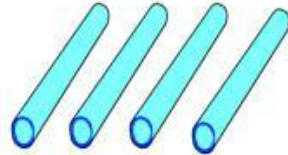


1 x blue slit rod

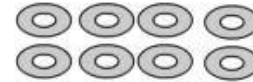


1 x 4mm dia, snap rod  
160mm long - dark grey

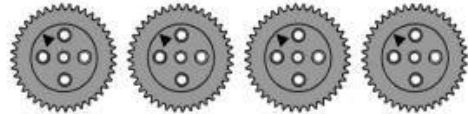
Use to join pulley wheel parts



4 x 200mm long 5mm dia. light blue tubes



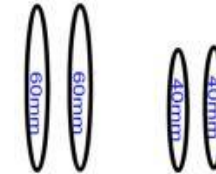
10 x 4mm steel washers



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



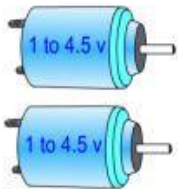
2 x 5mm dia. bendy dayglow tube



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

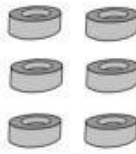


2 x 5mm blue collars



2 x Small motors 1.5V to 4.5 volts

Abrasive paper



6 x 4mm grey collars



**Kre8® Manual Controller**  
and ribbon cable

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

## 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 4mm Glue stick (possible), screwdriver for the Kre8 manual controller.

## 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.

**HELP**  
More support on the [Kre8.com](http://Kre8.com) website or email us [info@kre8.com](mailto:info@kre8.com)

# 1 - How to make the Kre8® 'Pop' Robot Frame

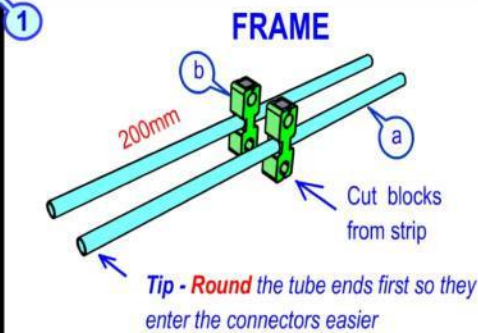
Tip - Visit [www.kre8.com](http://www.kre8.com) for movies and other support pages

## To Make

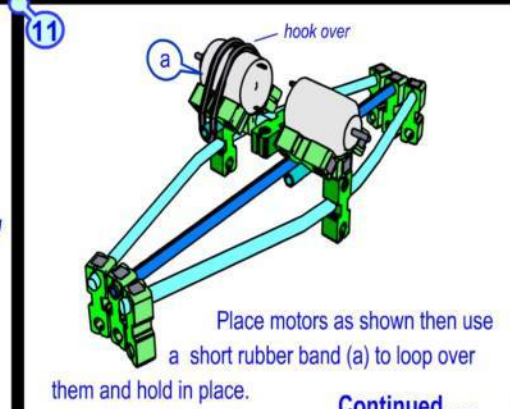
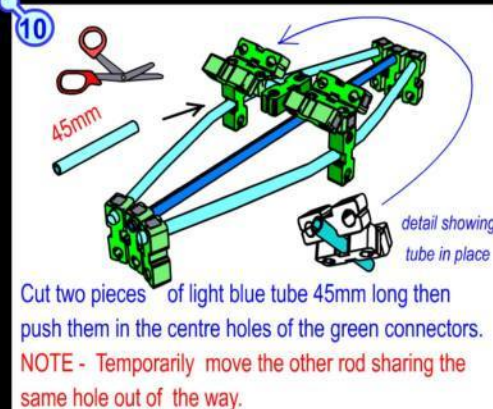
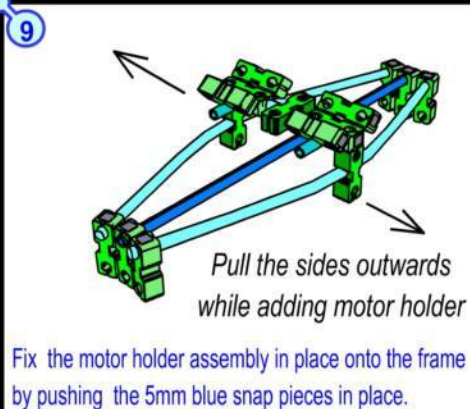
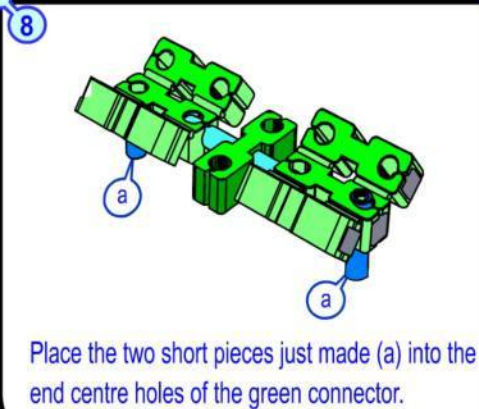
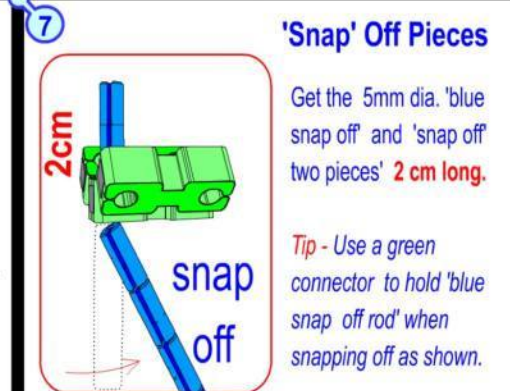
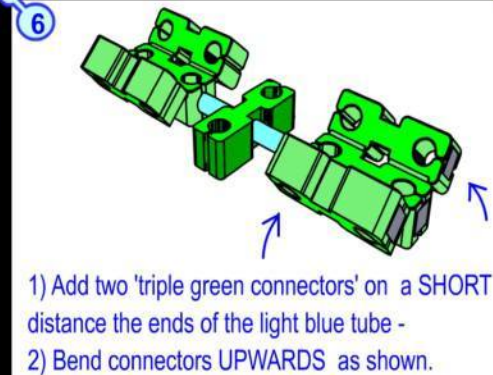
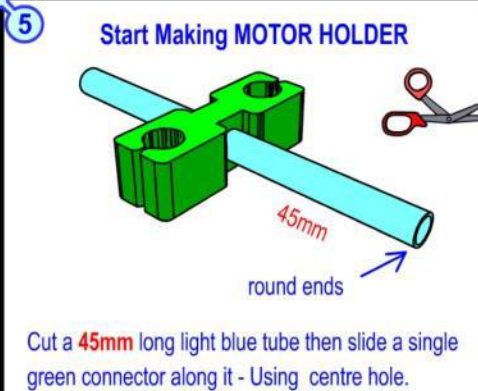
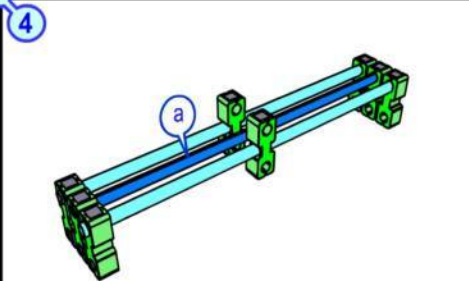
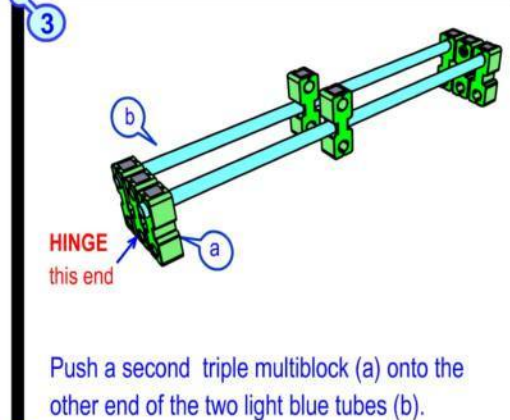
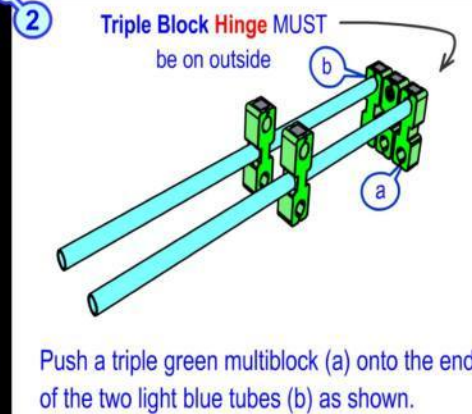
Follow the 'step-by-step' instructions provided and adapt as you want.

## NOTES

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



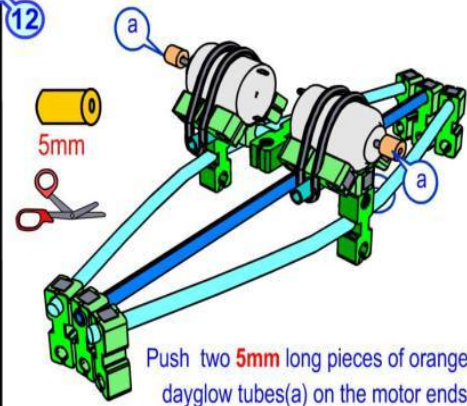
Select two of the 200mm long light blue tubes (a) then slide two green connectors (b) to the centre.



4

## 2 - How to make the Kre8® 'Pop' Robot Frame

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

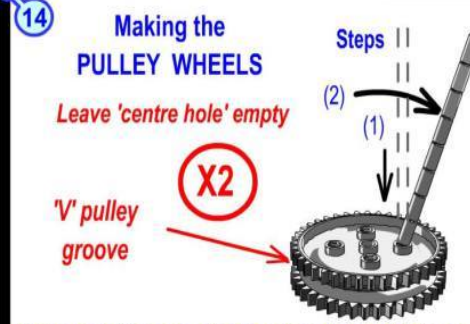


Push two 5mm long pieces of orange dayglow tubes(a) on the motor ends.



Adding Wheels - after looking at next step

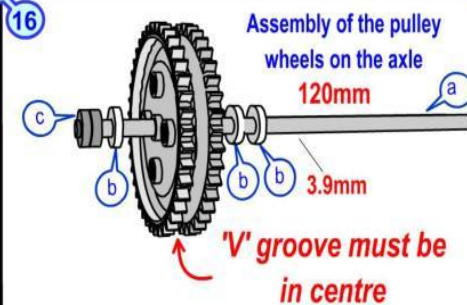
See next steps to help you.



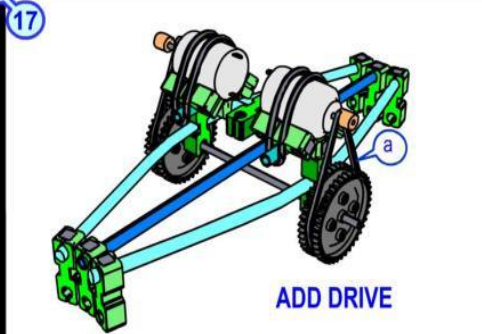
Make by joining two wheels so they form a 'V' groove.  
 (1) Push the 'grey snap rod' into the outer holes then  
 (2) snap off 1cm long snap rods by bending over.



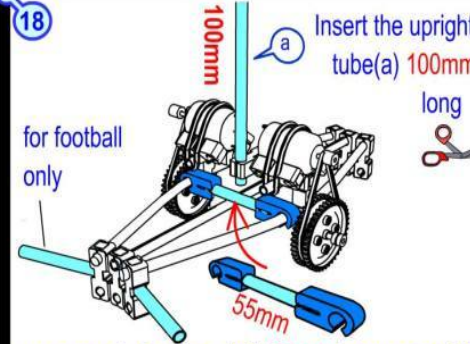
**SAFETY** If the axle hole needs enlarging, redrill over a block of wood NOT into your hand.



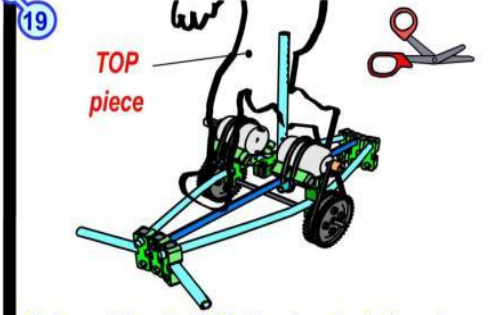
This drawing shows how to assemble the 'pulley wheels' onto the 3.9mm light grey tube (a) adding 3 metal washers (b) and 2 grey collars (c).



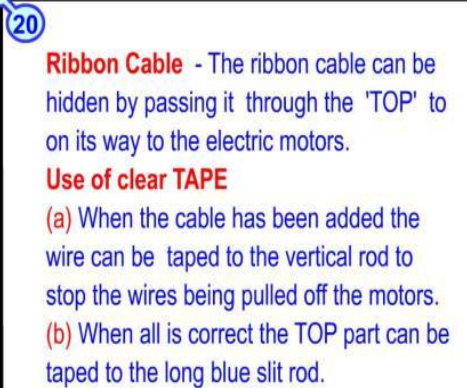
Add the rubber band drive (a) from motor pulley to pulley wheels.



recommended extra - Add 55mm long spacer tube. (Bend the 'long slit rod' down a little to add)



Before adding the TOP piece (e.g. footballer - shown in outline) follow the itop nstructions then slide it over the upright rod.



See 'Steering Electrics'

Page available from [Kre8.com](http://Kre8.com) if not provided

Note

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



\* Rods added for football use

# 5

## Ideas for Kre8® 'Pop' Robots Version 2

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)



**Jouster** - 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

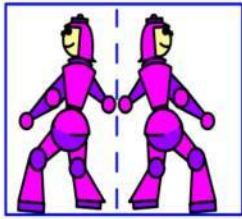
# 6

## Making your Kre8<sup>®</sup> POP Robot Tops (make your own)

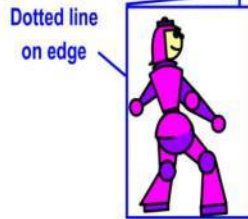
Plastic laminating technique

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

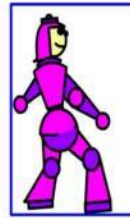
If you do not have a laminator, borrow one from your resource centre or ask them to do the following for you.



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



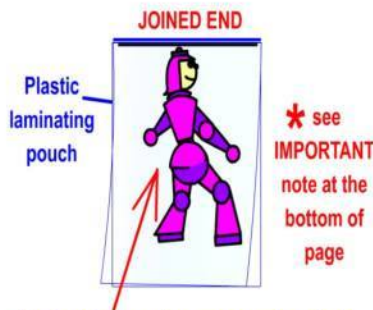
(2) Carefully fold paper in half along the dotted line.



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



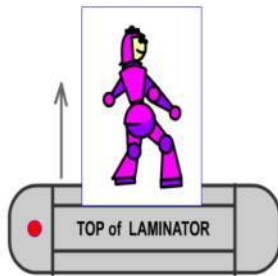
(4) Cut out the front and back parts together.



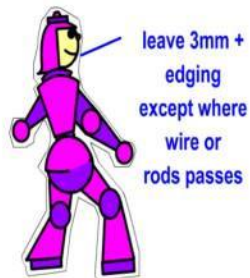
(5) Carefully insert your paper shape into the top end of the laminating pouch.



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



(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).

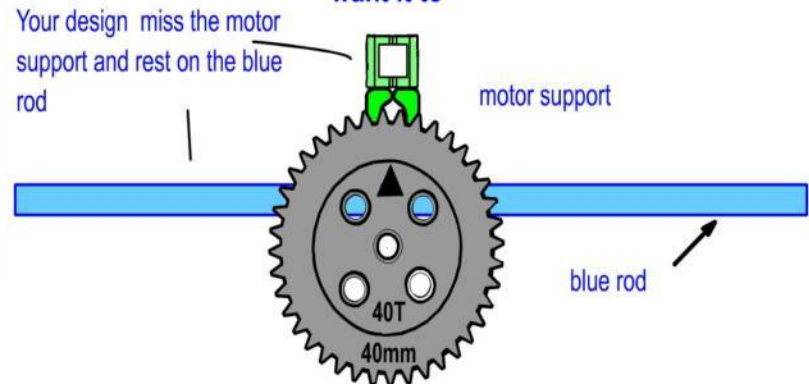


2) Cut both sides together (edges can be glue sticked while cutting out your design).



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



Laminated sheet

7



FOLD

FOLD



**Pre Laminated Version**

- 1) Cut out the two sides. (the black line shape)
- 2) Fold sides along the red fold red.
- 3) Tape edges together with clear tape.
- 4) Slide support rod & cable between the front and back.

CUT OUT GUIDE LINE

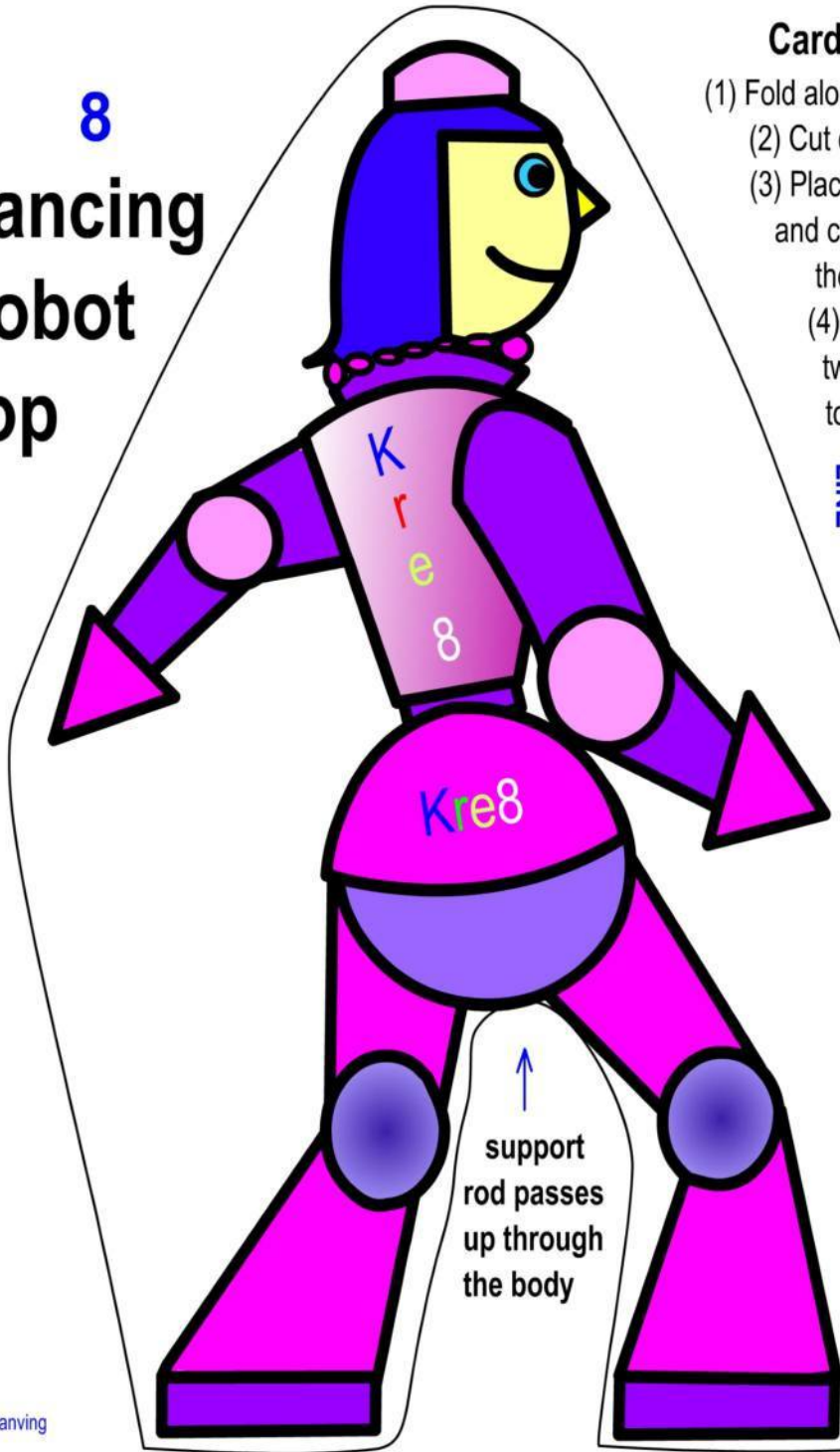
FootballOutline

# Soccer Robot Top

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

place feet in rod slots on robot and tape

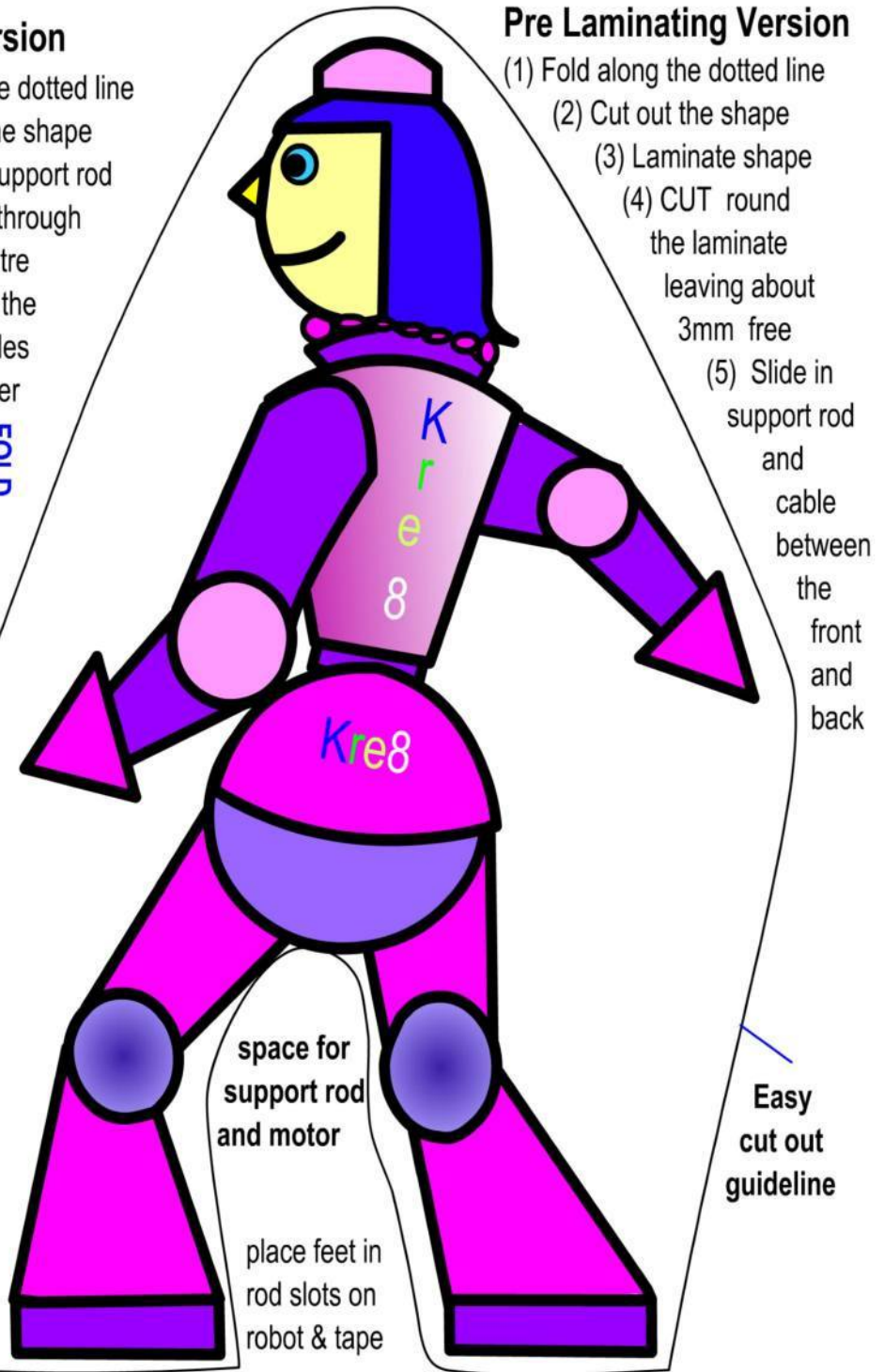
# 8 Dancing Robot Top



## Card Version

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

FOLD LINE



## Pre 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 rod and cable between the front and back

Easy cut out guideline

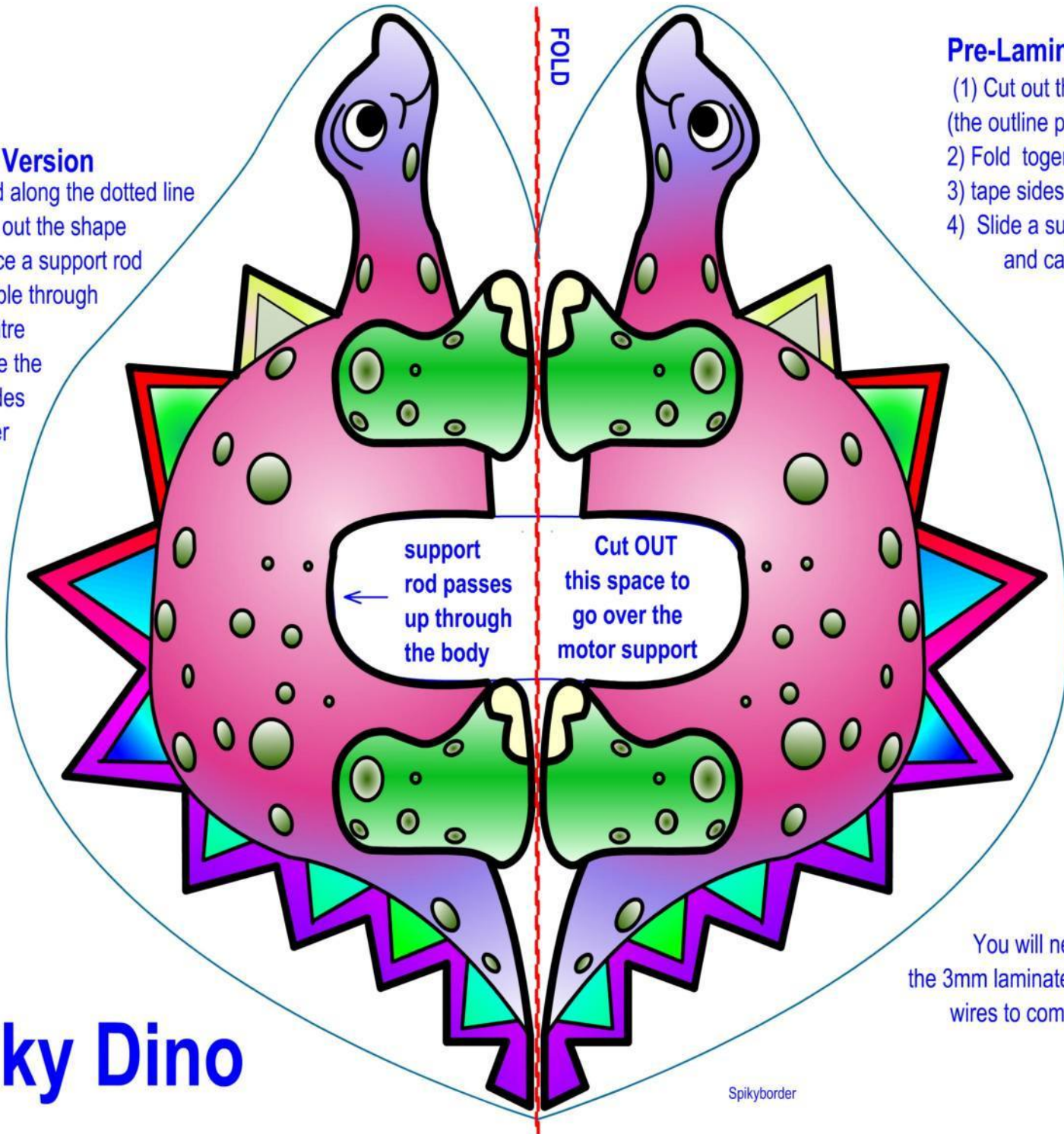
# 9

## Card Version

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

## Pre-Laminating Version

- (1) Cut out the shapes (the outline part)
- (2) Fold together
- (3) tape sides - clear tape
- (4) Slide a support rod and cable **between** the front and back



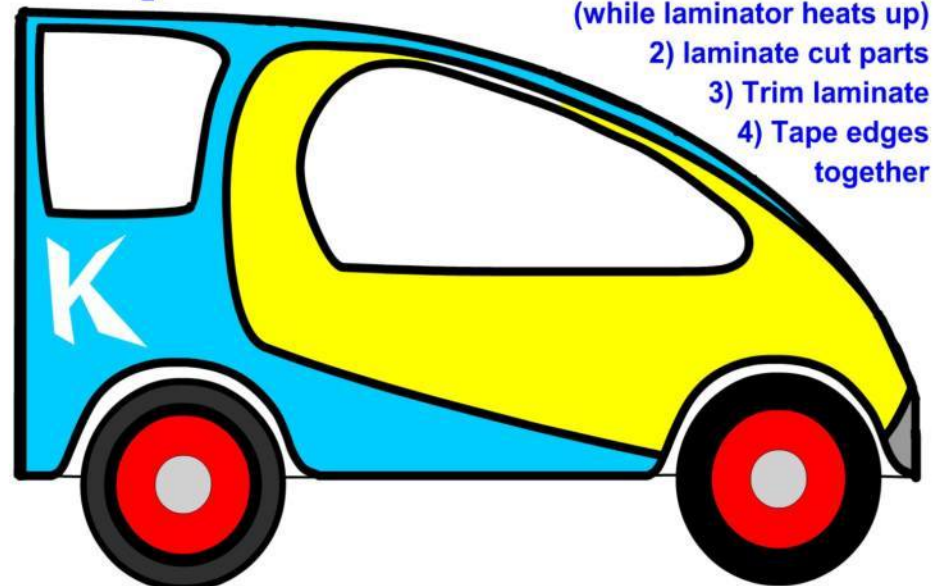
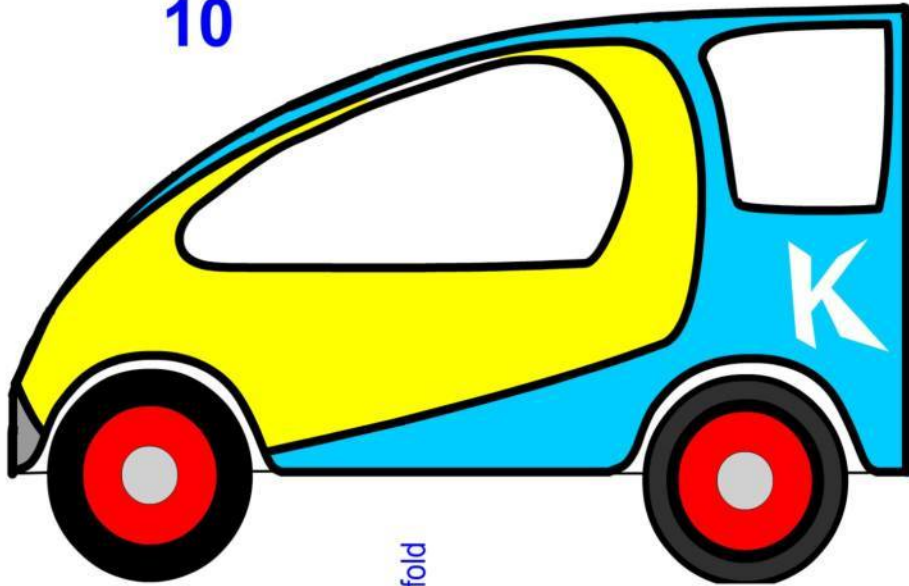
# Spiky Dino

Spikyborder

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

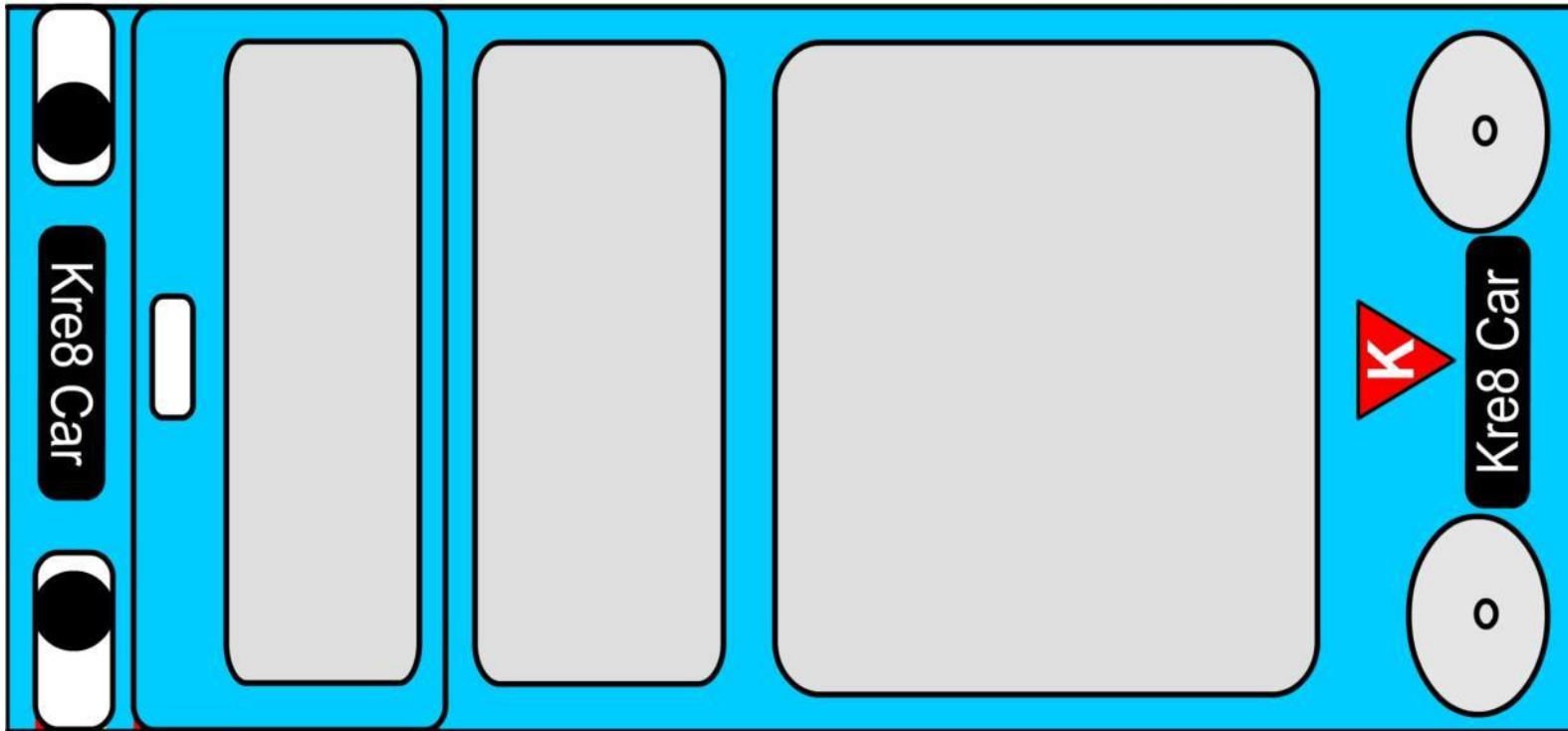
# Car Top

10



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

fold

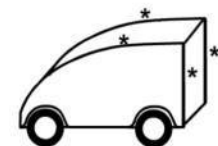


fold

**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.



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

- Self LAMINATED VERSION**
- 1) Fold along the dotted line
  - 3) Cut out the horse
  - 4) Cut out jousting
  - 6) Fold together
  - 7) Laminate
  - 8) trim

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

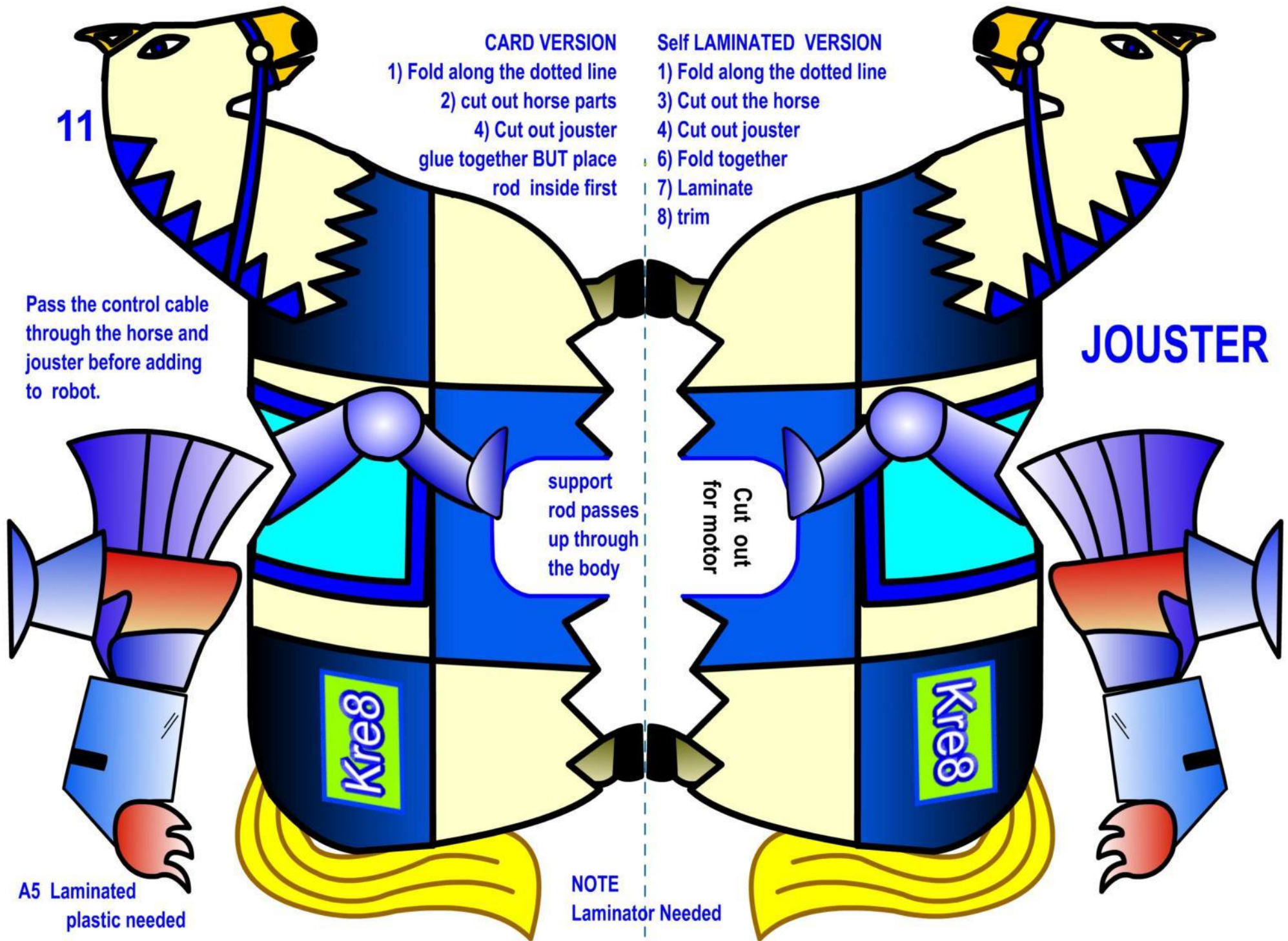
**JOUSTER**

support rod passes up through the body

Cut out for motor

A5 Laminated plastic needed

NOTE Laminator Needed



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## 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

Fold line