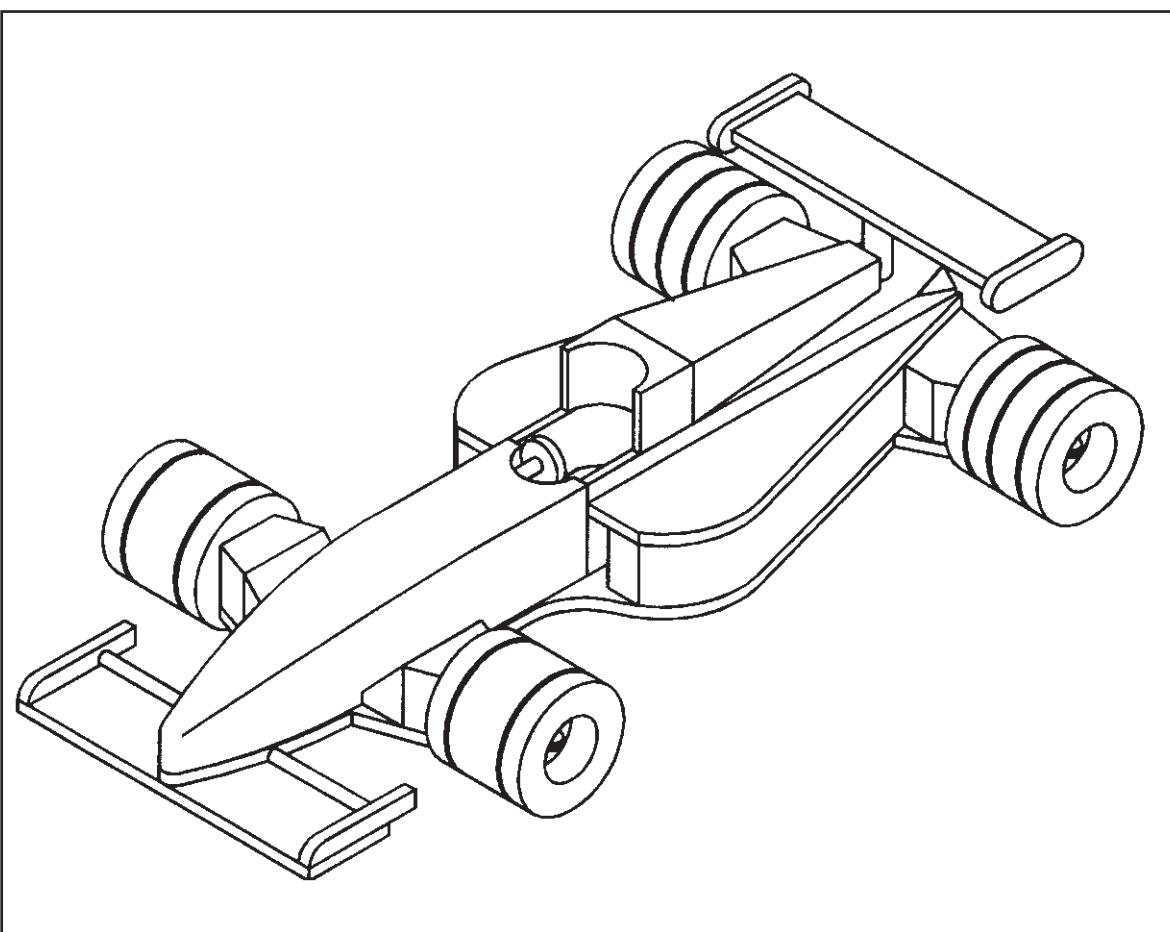


# OPITEC

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*R a c i n g   c a r*



**Please Note**

The OPITEC range of projects is not intended as play toys for young children. They are teaching aids for young people learning the skills of Craft, Design and Technology. These projects should only be undertaken and tested with the guidance of a fully qualified adult. The finished projects are not suitable to give to children under 3 years old. Some parts can be swallowed. Danger of suffocation!

## 1. Product information:

**Article:** Model as a construction pack

**Use:** In Design Technology Key stage 3

## 2. Material information

**2.1. Material:** Pine (coniferous) soft wood  
Beech (deciduous) hard wood  
Wood should be relatively dry before working

**Working:** wood can be sawn, planed, shaped and drilled  
Mark out with measurement or use patterns

**Joining:** glue PVA  
screws  
dowels

**Finish:** use wax (liquid or solid)  
clear wood varnish  
stain ( coloured, water soluable-then varnish)

**2.2. Material:** Plywood (Gabun) multi-layered  
with alternating grain direction

**Working:** Plywood can be sawn with a fret saw, filed and shaped  
Mark out by measurement or use patterns

**Joining:** glue (PVA)

**Finish:** as above

## 3. Tools:

**Sawing:** use a fret saw for all curves that cannot be cut by a straight back saw

**Note!** fret saw blades should be inserted with their teeth facing forward

Fine straight cuts can be made with a Gents / Dovetail type saw

**NOTE:** Hold the work tightly in a vice or clamp

**Rasp/file:** use a rasp or file for shaping or a small needle file for slots etc

**Note!** rasps and files only cut on the forward stroke

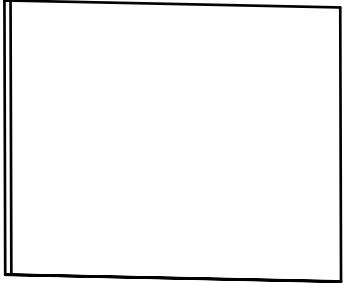
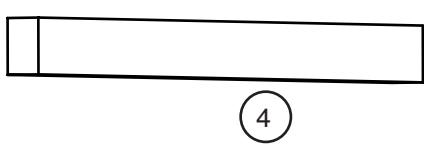
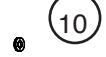
**Sanding:** use a suitable grade of glasspaper for finishing

**Drilling:** use a pillar drill;

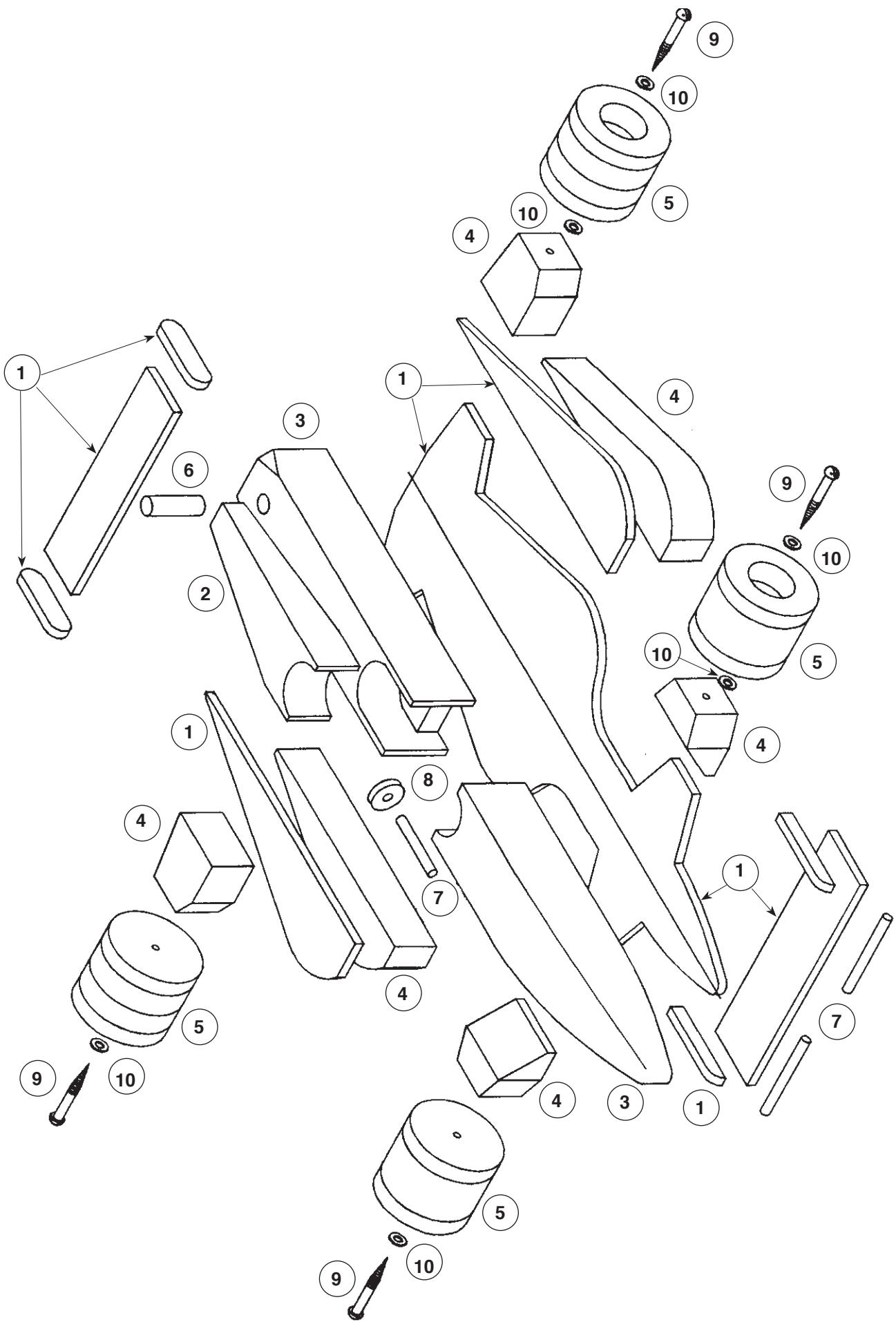
**Note!** for deep holes use a Forstner type bit, first ask your teacher to check that the work is set correctly up  
Please observe the safety rules eg. all long hair tied back, no rings or jewellery to be worn, no loose clothing and wear safety glasses. Do not forget to clamp the work securely

**Holding:** use the correct clamps  
make sure that you hold the work in a machine vice when drilling, use soft jaws!

#### 4. Parts list

Description	Material	Quantity	Size	Diagram
<b>Base</b> <b>Spoiler</b> <b>Side cover</b>	Plywood	1	4 x 145 x 300 mm	
<b>Fairing</b>	Pine strip	1	20 x 30 x 100 mm	
<b>Cockpit</b>	Pine strip	2	30x 30 x 300/350 mm	
<b>Sides</b>	Pine strip	1	20 x 30 x 350 mm	
<b>Wheels</b>	Dowel	2	40 dia x 75mm	
<b>Dowel</b>	Pine	1	8 dia x 50mm	
	Beech	1	4 dia x 250mm	
<b>Steering wheel</b>	Pulley	1	15 mm dia	
<b>Wheel fixings</b>	Metal	4	3 x 40 mm	
	Washers	8	4.3mm	

## 5. Exploded diagram



## 6. Planning overview

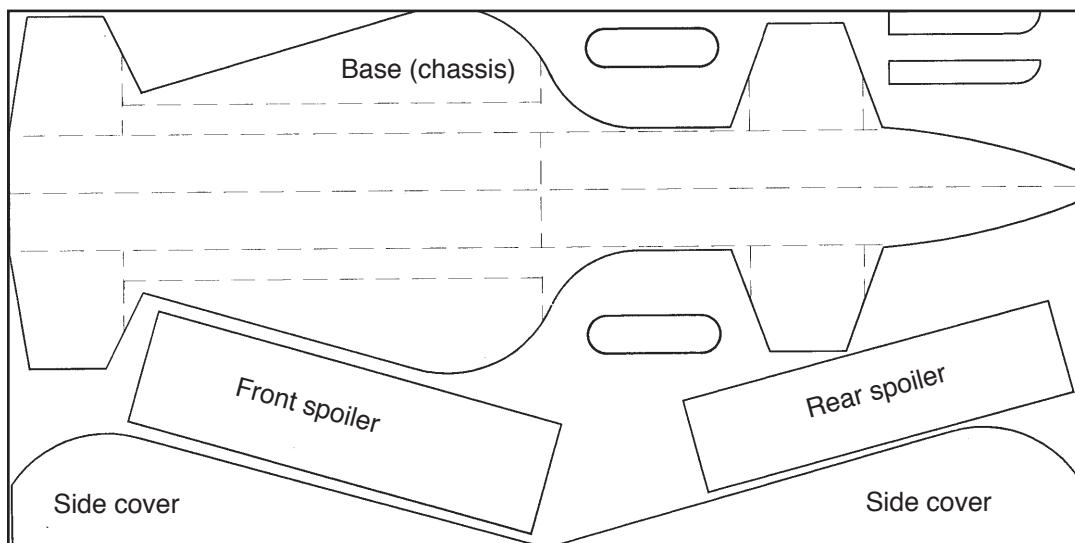
- 6.1 Planning and making the chassis (base), front and rear spoilers and side covers
- 6.2 Making the cockpit and fairing
- 6.3 Making the side tanks and stub axles
- 6.4 Assembling the cockpit and stub axles
- 6.5 Making the steering wheel and rear spoiler fixing
- 6.6 Assembling the spoiler and steering wheel
- 6.7 Mounting the front wheels
- 6.8 Testing and modifying
- 6.9 Decorative finish

### 6.1. Planning and making the chassis (base), front and rear spoilers and side covers

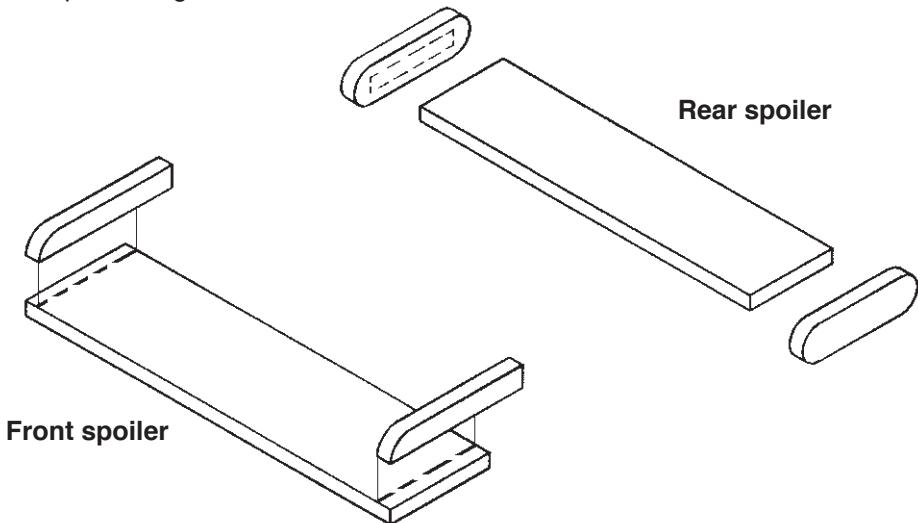
6.1.1 Trace the patterns (page 11/13) on to the plywood sheet (1) and cut out the shapes. Clean up all the edges with glasspaper.

**Tip!** for group work it may be easier to make card patterns so that the pupils can draw around them.

1



6.1.2 Glue the front and rear spoilers together as shown

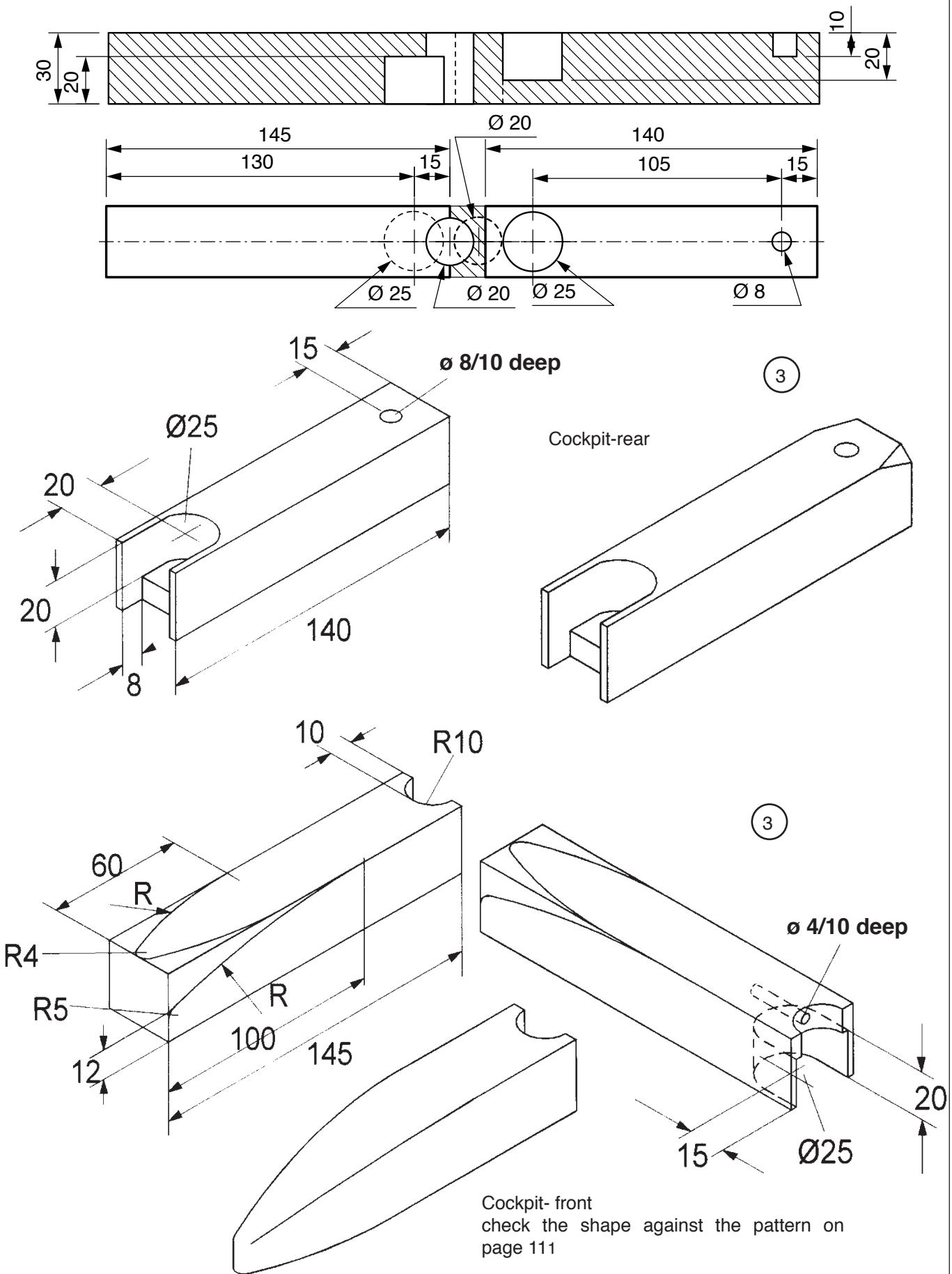


## 6.2. Making the cockpit and fairing

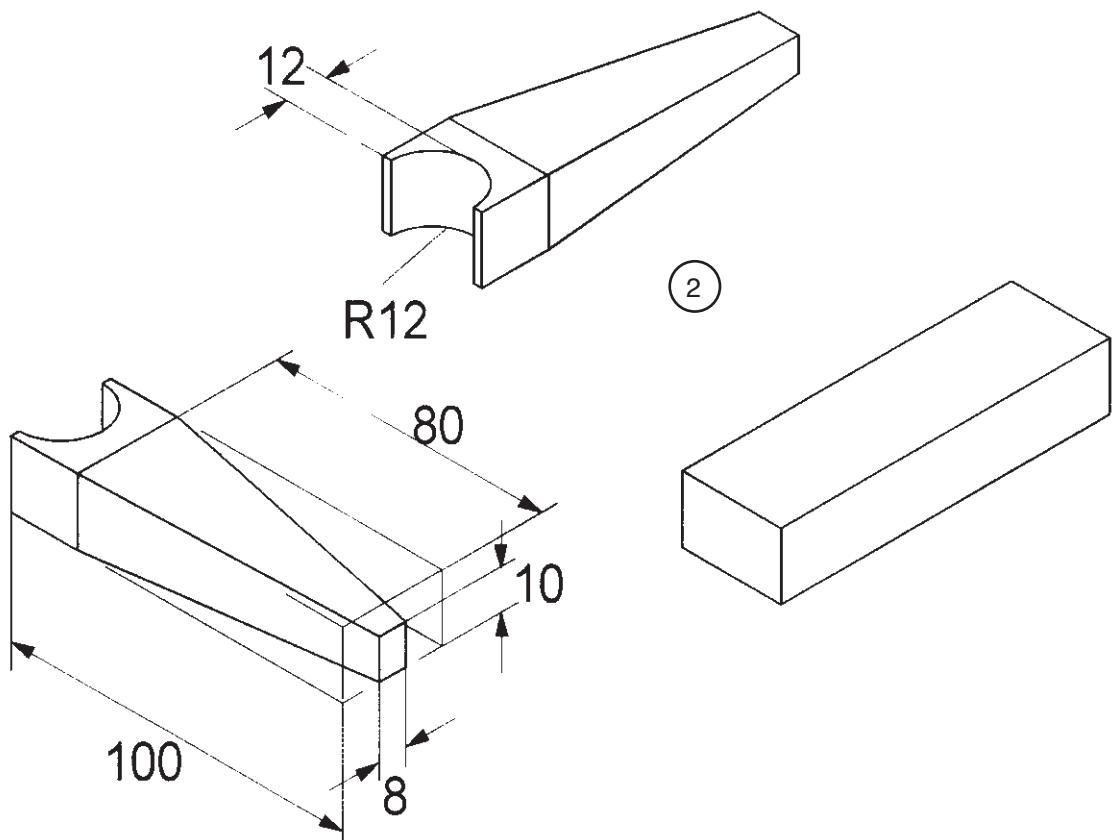
6.2.1 Mark out the front and rear cockpit parts on the pine strip (3) then saw and shape.

**Note!**

check with your teacher before drilling the 20/25 mm holes



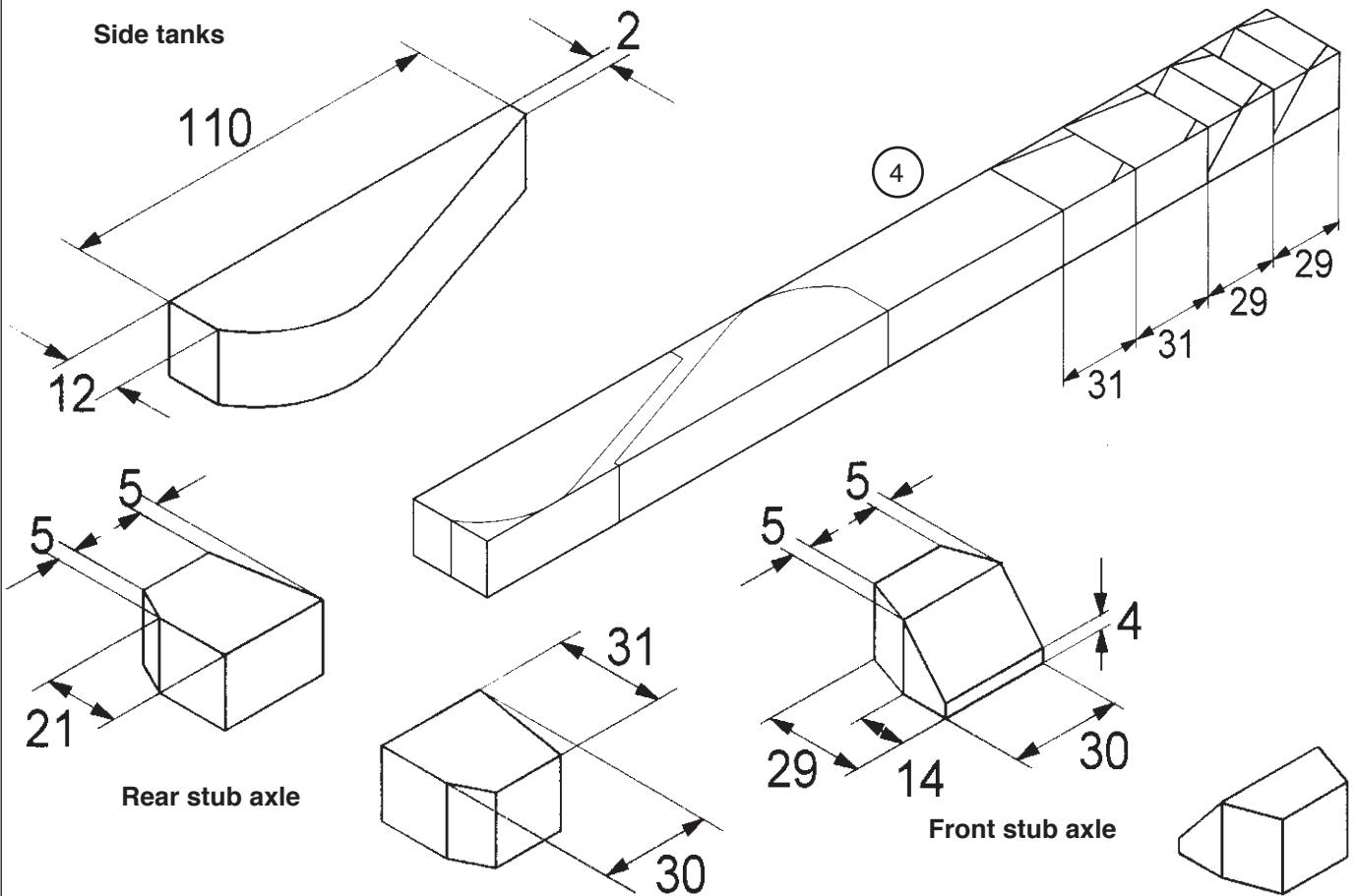
6.2.2 Cut and shape the parts as shown, from pine strip (2) to cockpit fairing



### 6.3. Making the sides (tanks) and axles

6.3.1 Use the patterns on page 11 to mark out the side tanks and axle supports on to the pine strip (4). Saw out and sand to finish

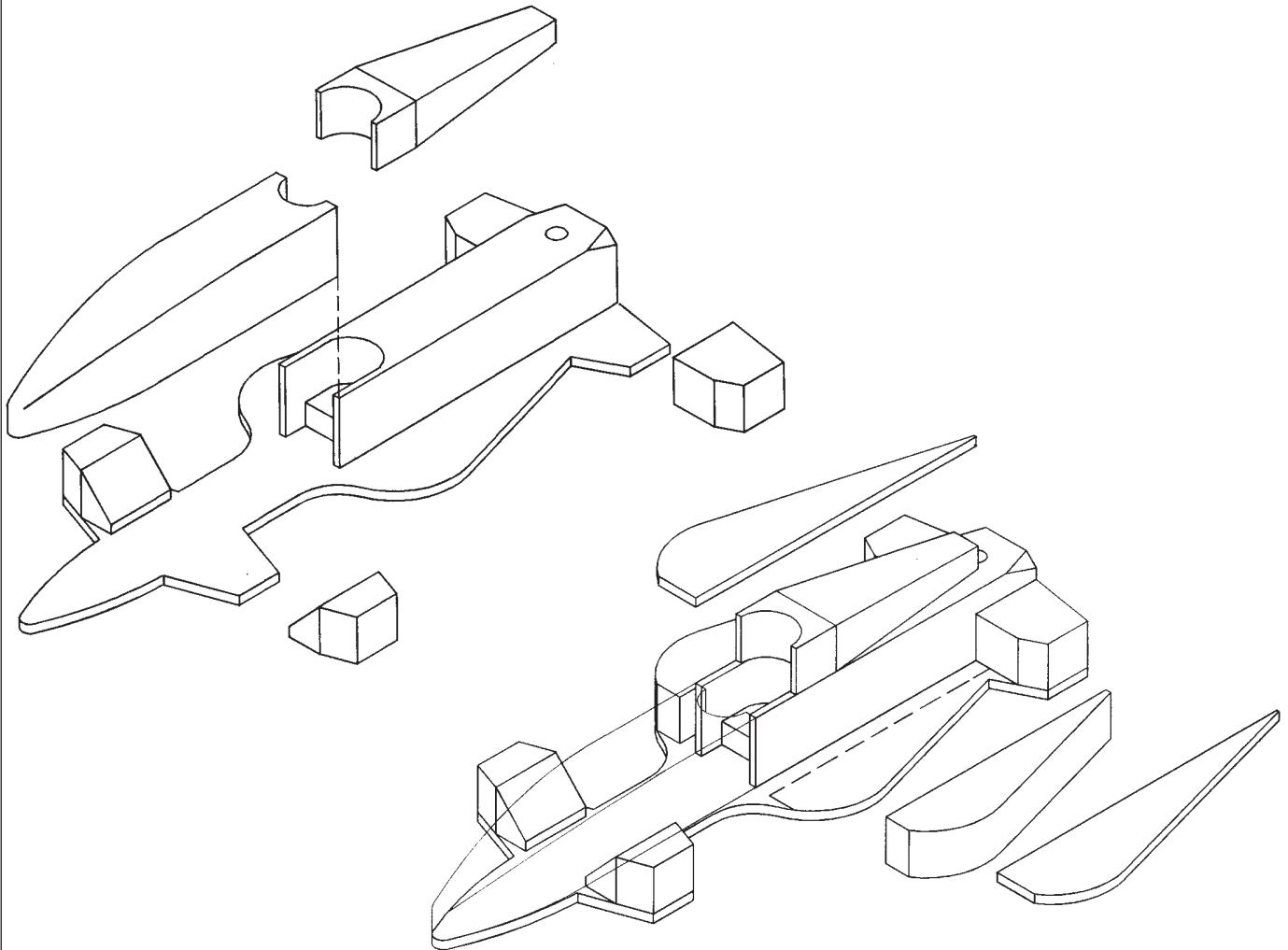
6.3.2 Make each individual part as shown



## 6.4 Assembling the cockpit and axles

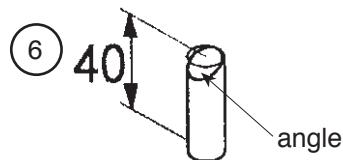
Glue the cockpit parts, fairing, sides, covers and stub axles on to the chassis base as shown in the diagram

**Note!** Make sure that both halves of the cockpit fit on the chassis!



## 6.5 Making the steering wheel and rear spoiler fixing

6.5.1 Mark out and saw 40mm from the pine dowel (6) and angle the top as shown



6.5.2 Saw 20mm from the beech dowel (7)

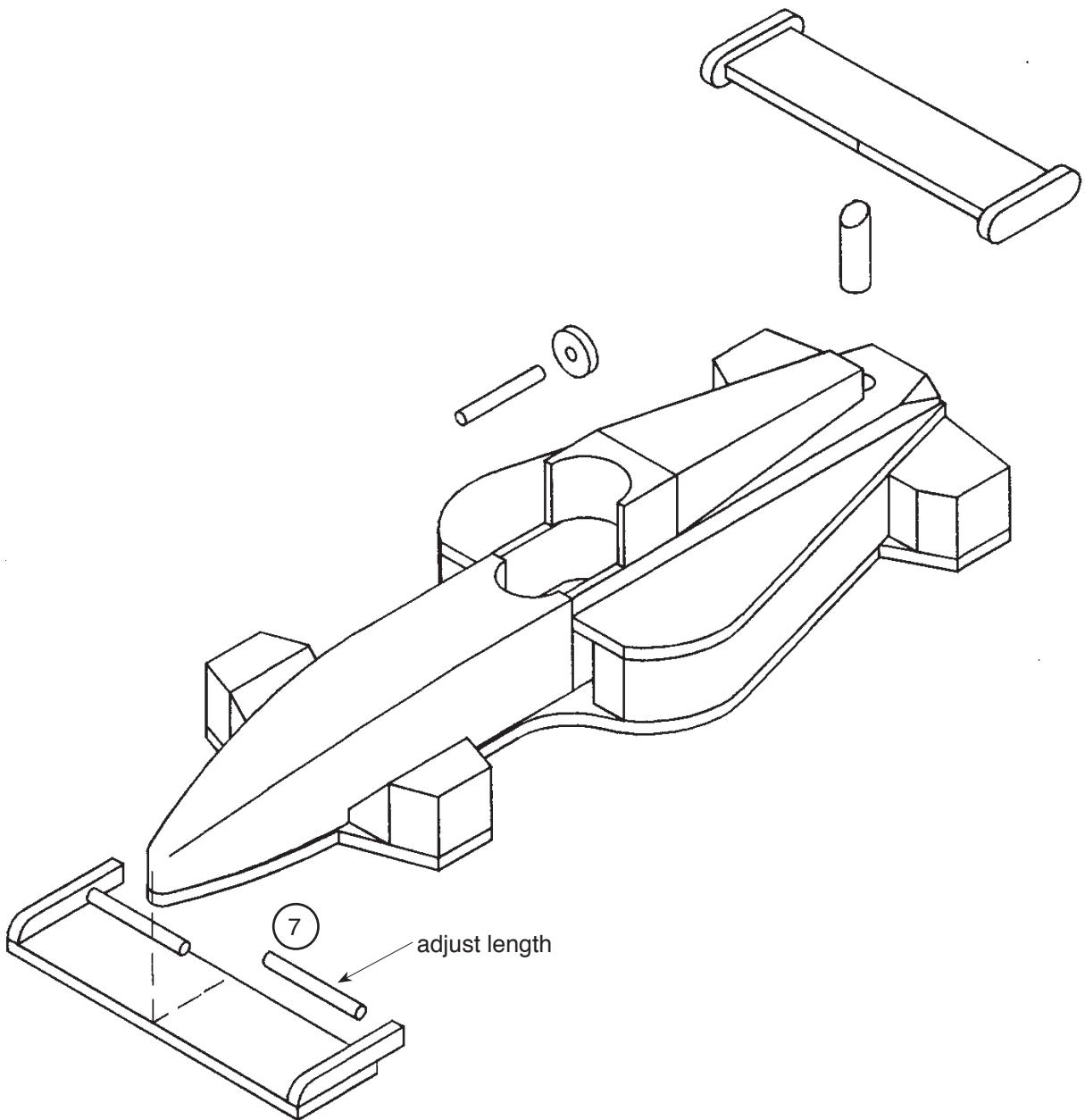
6.5.3 Saw the pulley (8) in half and glue one half on the end of the 4 x 20mm dowel



## 6.6 Assembling the spoiler and wheel

6.6.1 Glue the steering wheel, front and rear spoilers to the model as shown in the diagram

6.6.2 Mount the front spoiler as shown by cutting the beech dowel (7) to fit.

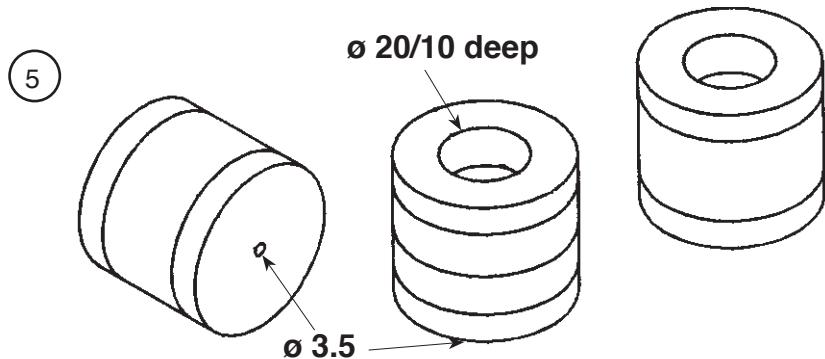


## 6.7 Making and assembling the wheels

6.7.1 Saw the round wood (5) for the wheels in half as shown and drill a 20mm dia hole in one end.

**Note!** check with your teacher that the work is secure before drilling

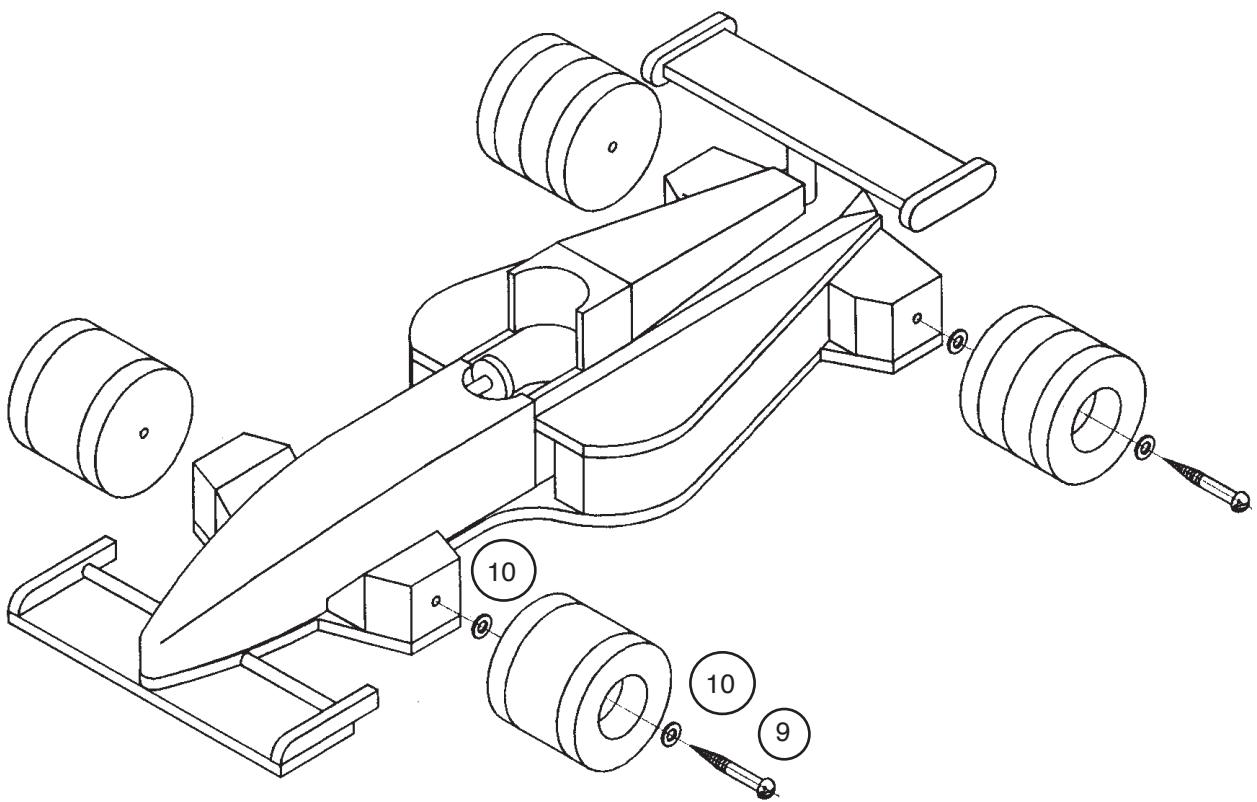
6.7.2 Mark out the profile on the wheels with a triangular file



### 6.7.3 Mount the wheels on the stub axles using the screws (9) and washers (10) as shown

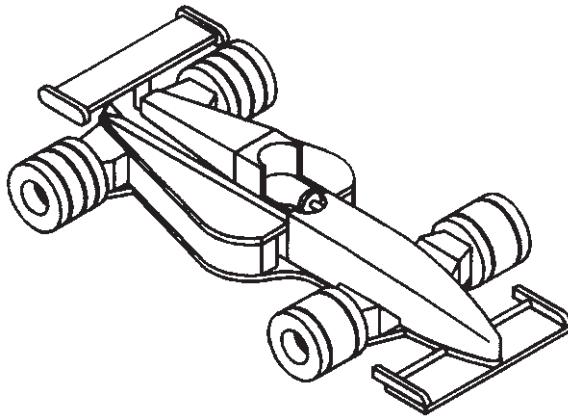
**Tip:**

Drill a small hole first 1.5dia x 10mm deep



### 6.8 Testing and modifying

Check that the wheels turn smoothly adjust as necessary



### 6.9 Decorative finish

Research your favourite race teams colour scheme or make your own personal colour scheme.

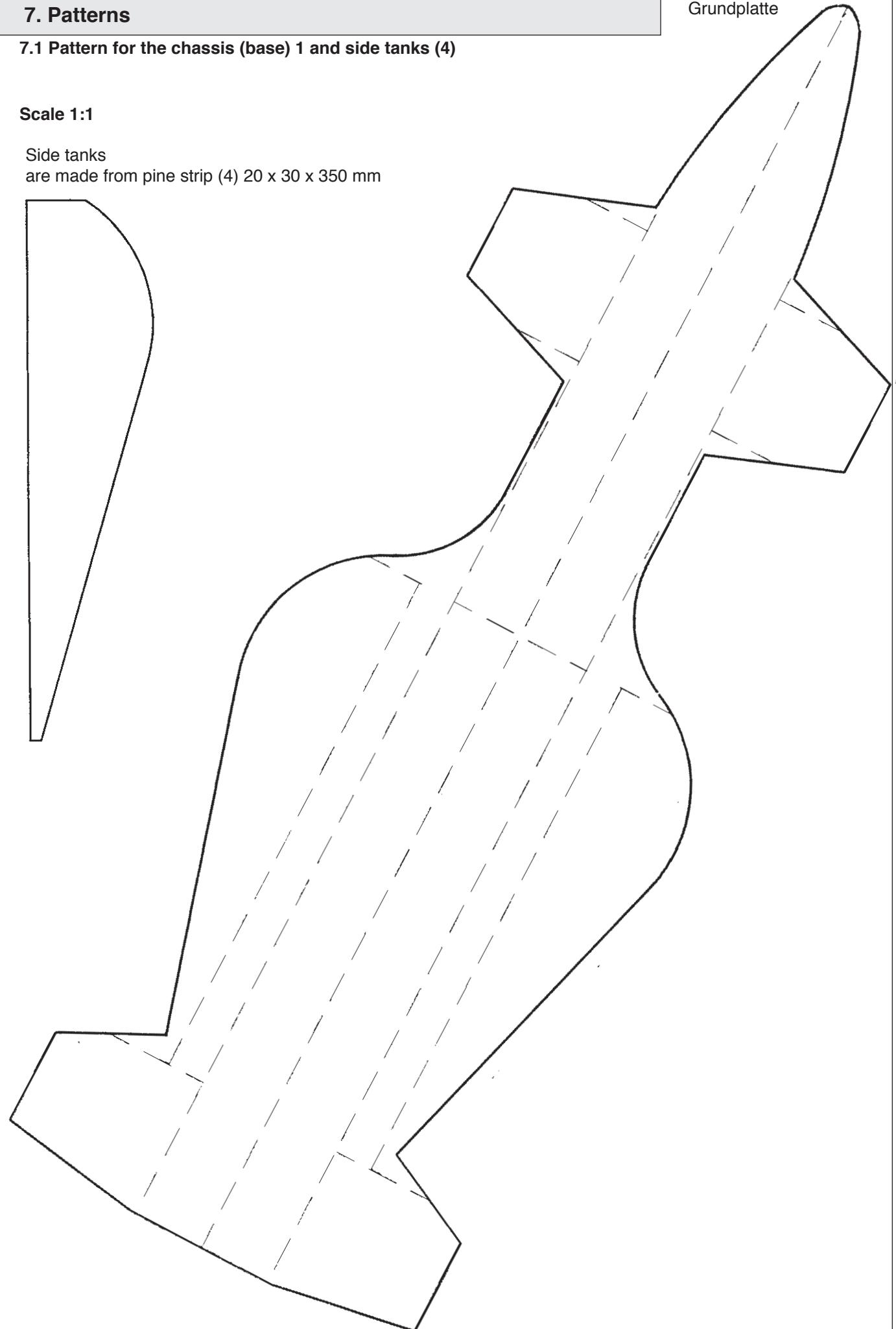
## 7. Patterns

Grundplatte

### 7.1 Pattern for the chassis (base) 1 and side tanks (4)

Scale 1:1

Side tanks  
are made from pine strip (4) 20 x 30 x 350 mm



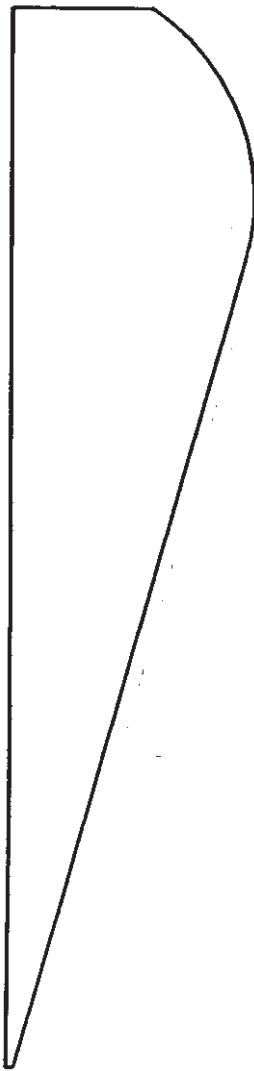


## 7. Patterns

### Patterns for the spoilers, spoiler ends side covers

Scale 1:1

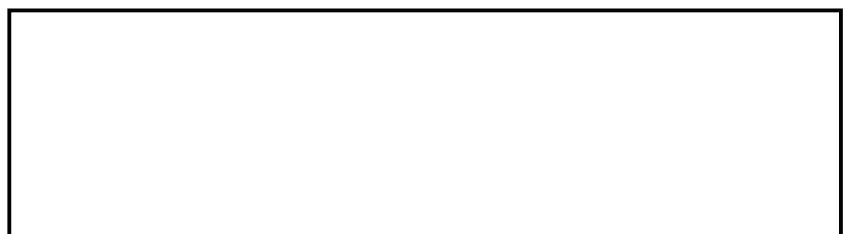
Side covers x 2



Rear spoiler



Front spoiler



Front spoiler ends x 2



Rear spoiler ends x 2

