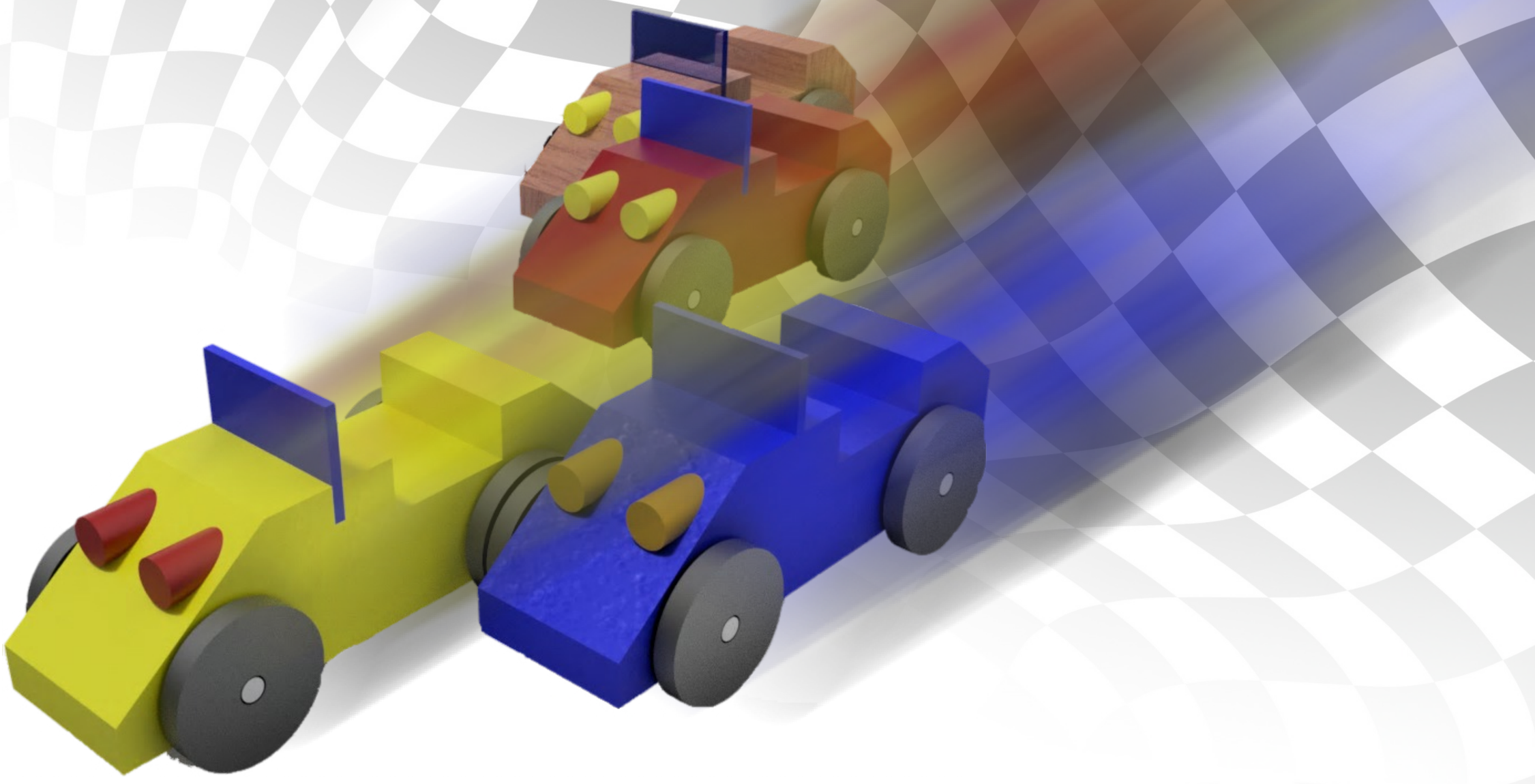
Boclair Technical

Speedway Car Race



Name_____Class_____ Teacher_____

Boclair Technical

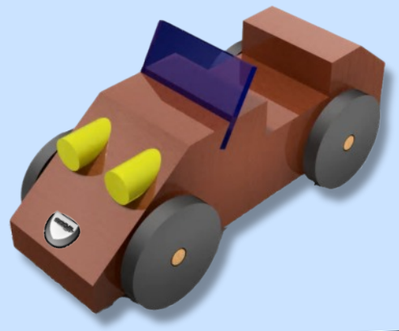
Speedway Car Race

START!

Brief

The "Wooden Toy Company" are asking you to **Design** and **Manufacture** a wooden toy car that would be suitable for use by a toddler and for racing in the *Boclair Speedway Car Race.*

Car body size: *150 x 45 x 45 mm*



Activity 1 — BRIEF AND SPECIFICATION

Analysing the Design Brief and writing a specification.

1. Copy the **brief** into your folio and analyse it along with your teacher, as a class, and decide what it needs to do.
2. Begin by writing *"The design for the car should:"* and then list as bullet points.

Things to think about....

- What does the product have to do?
- What is its job?
- How should it look?
- Who should it appeal to?

Activity 2 — IDEA GENERATION

As a designer, you should come up with a few initial ideas before choosing a final design. You have been asked to generate at least 6 different designs for your toy car.

On the worksheet provided, sketch different shapes on the templates provided.

Remember:

You should restrict your design around key features such as the axles, so that the wheels won't fall off!

Activity 3 — YOUR DESIGN PROPOSAL

Your teacher will act as an engineering consultant and advise you if this is a suitable design for you to make. Once you have decided on your idea, you will make a template. You will then produce a final drawing of your idea that could be shown to the client.

Making a Template

Templates can be used by manufacturers to ensure that a number of things can be marked out the exact same size.

Make a card template of your final design.

Activity 4 — 3D COMPUTER MODEL

You will be asked to produce a 3D computer model of your final design.

You will be introduced to *Autodesk Inventor* by your teacher. They will show you the steps to create your design.

Activity 5 — 3D ASSEMBLY & RENDER

Now that you have modelled all the individual parts of the car, you must assemble them.

Once assembled, apply a material to each part and then render it.

Your teacher will demonstrate each stage to you in class.

Activity 6 — LOGO DESIGN

As part of your design, you are asked to produce some ideas for a logo. This will be placed on your car.

Complete the car logo design worksheet and in the final box.

You will then produce your logo on *Serif DrawPlus.* This will be printed out and stuck on

Activity 7 — PLAN FOR MANUFACTURE

Before making a project it is important to plan what you are going to do. This ensures you have all the equipment you need and that you understand each stage of manufacture.

Your teacher will supply you with a Gantt Chart, explaining each stage of the manufacture.

In groups, you must put the steps in order, naming tools and machines.

After this, each pupil must complete the Gantt chart in the correct order.

Activity 8 MANUFACTURE

You will now manufacture your car design in the workshop.

Your teacher will demonstrate each stage, showing your the standard parts of the car (the seat, the windshield, the holes for the wheels and headlights).

Activity 9 DECORATION

Once you have manufactured your car, you will decorate it using paint.

You can add your design e.g. stripes, at this stage and then attach a print our of your logo design. Alternatively, you could also attempt to draw or paint your logo.

Activity 10 EVALUATION

It is important to test your prototype to see if it meets the points listed in the Design Specification. It also allows you to learn from any mistakes and improve the design.

List each specification point and give yourself a mark out of 5 on the worksheet.

Next, write down any mistakes or criticisms you have of your craftship (how well and accurate you have made it).

Things to think about:

Is the wood well finished and free from pencil and saw marks?

Are there any paint runs?

Are the wheels level?

What do you think would make it perform well in the race?

FINISH!

Activity 11

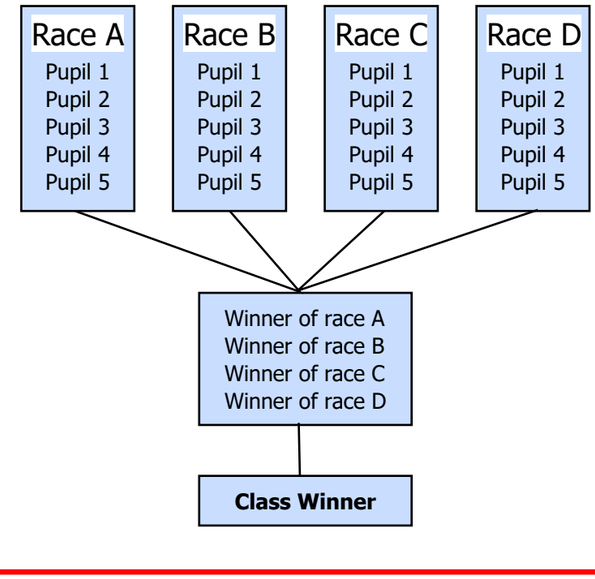
Boclair Speedway Race

Class Race Format

The class will be randomly split into 4 different groups of 5.

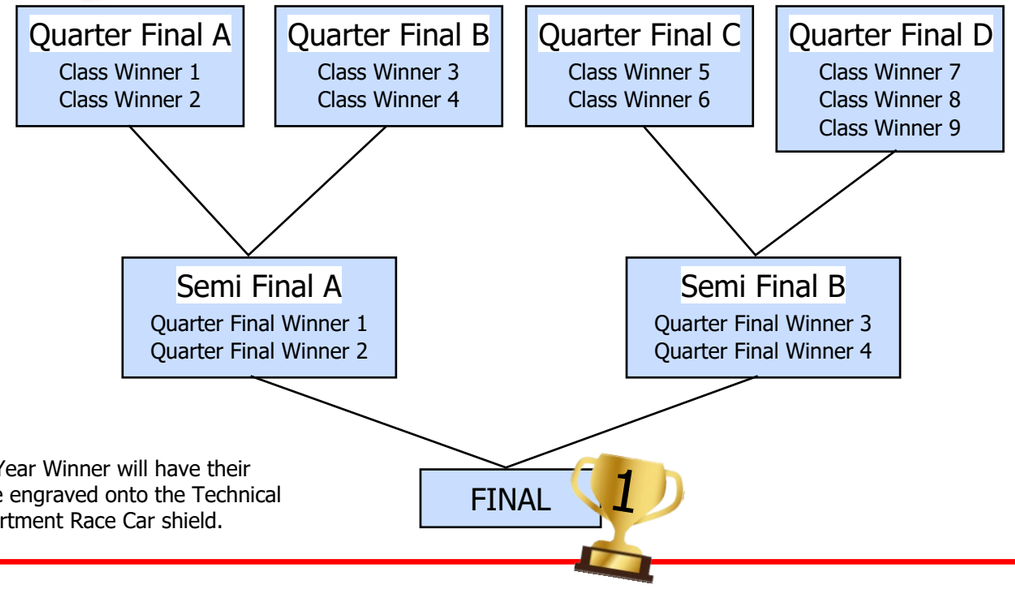
The winner of each race will then race the other group winners.

The winner will represent the class in the quarter finals, semi finals and the final if they make it!



Year Race Format

The class winners will race in the quarter finals. The semi-finalists will then race for a place in the grand final!



The Year Winner will have their name engraved onto the Technical Department Race Car shield.

Boclair Technical
Speedway Car Race

ACTIVITY 1

BRIEF

Copy out the brief from the blue box on the first page of this document.

SPECIFICATION

The design for the car should….

Things to think about….

- What does the product have to do?
- What is its job?
- How should it look?
- Who should it appeal to?

Boclair Technical

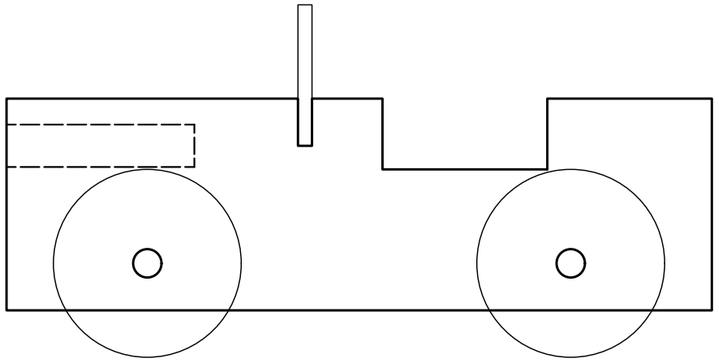
Speedway Car Race

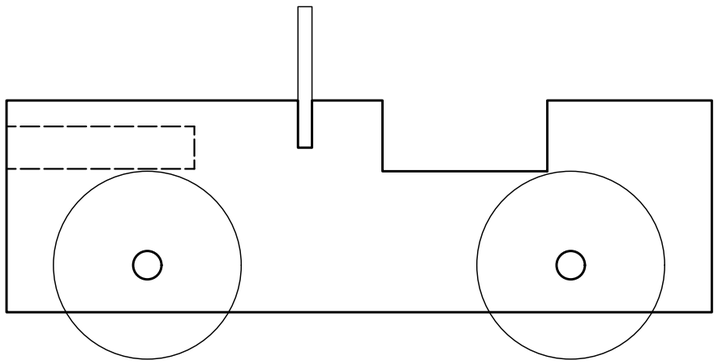
IDEA GENERATION - ACTIVITY 2

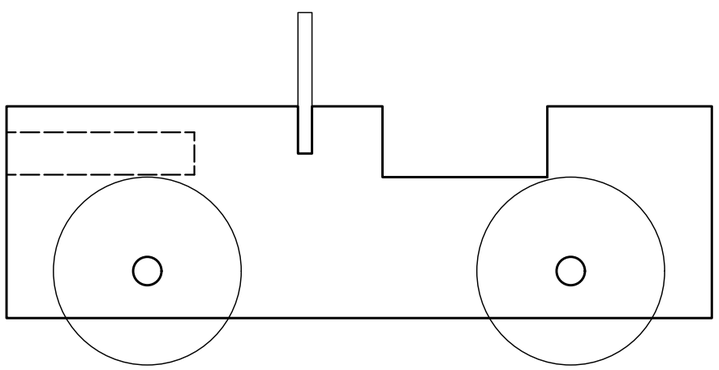
As a designer, you should come up with a few initial ideas before choosing a final design. You have been asked to generate at least 3 different designs for your toy car. On the worksheet provided, sketch different shapes on the templates provided.

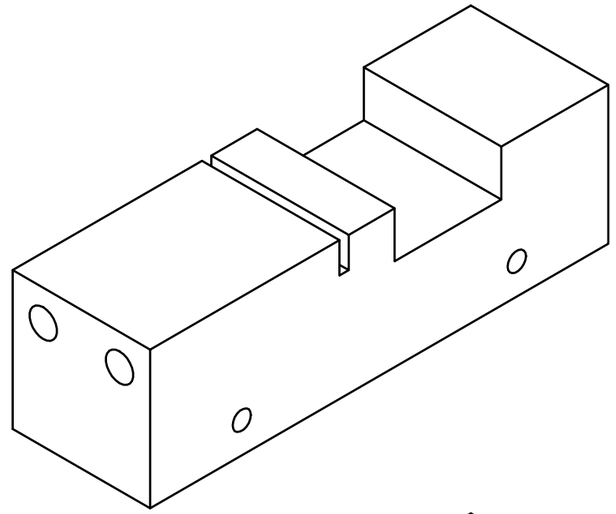
Remember:

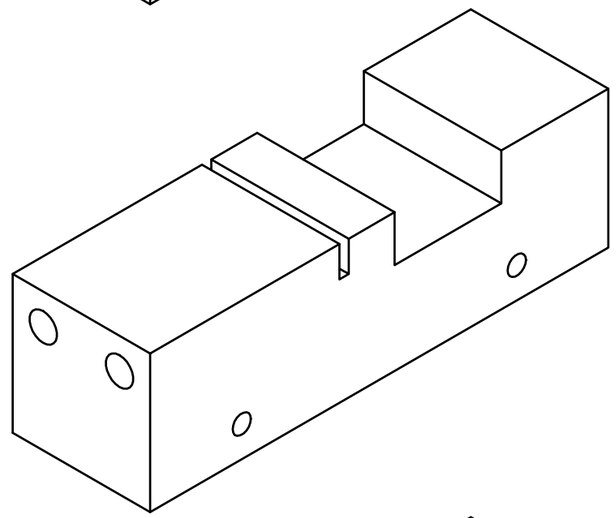
You should restrict your design around key features such as the axles, so that the wheels won't fall off!

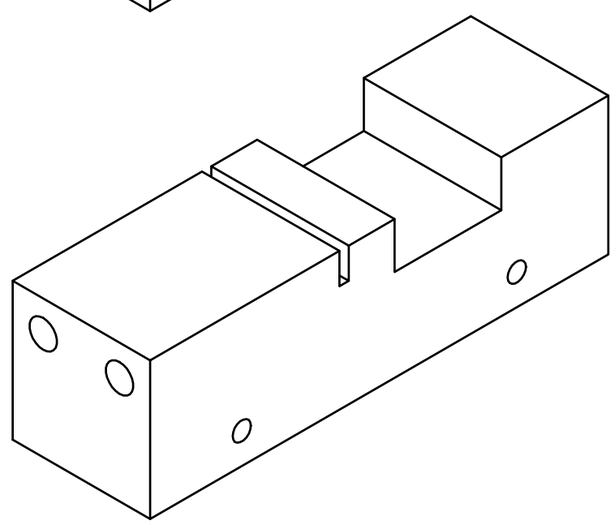












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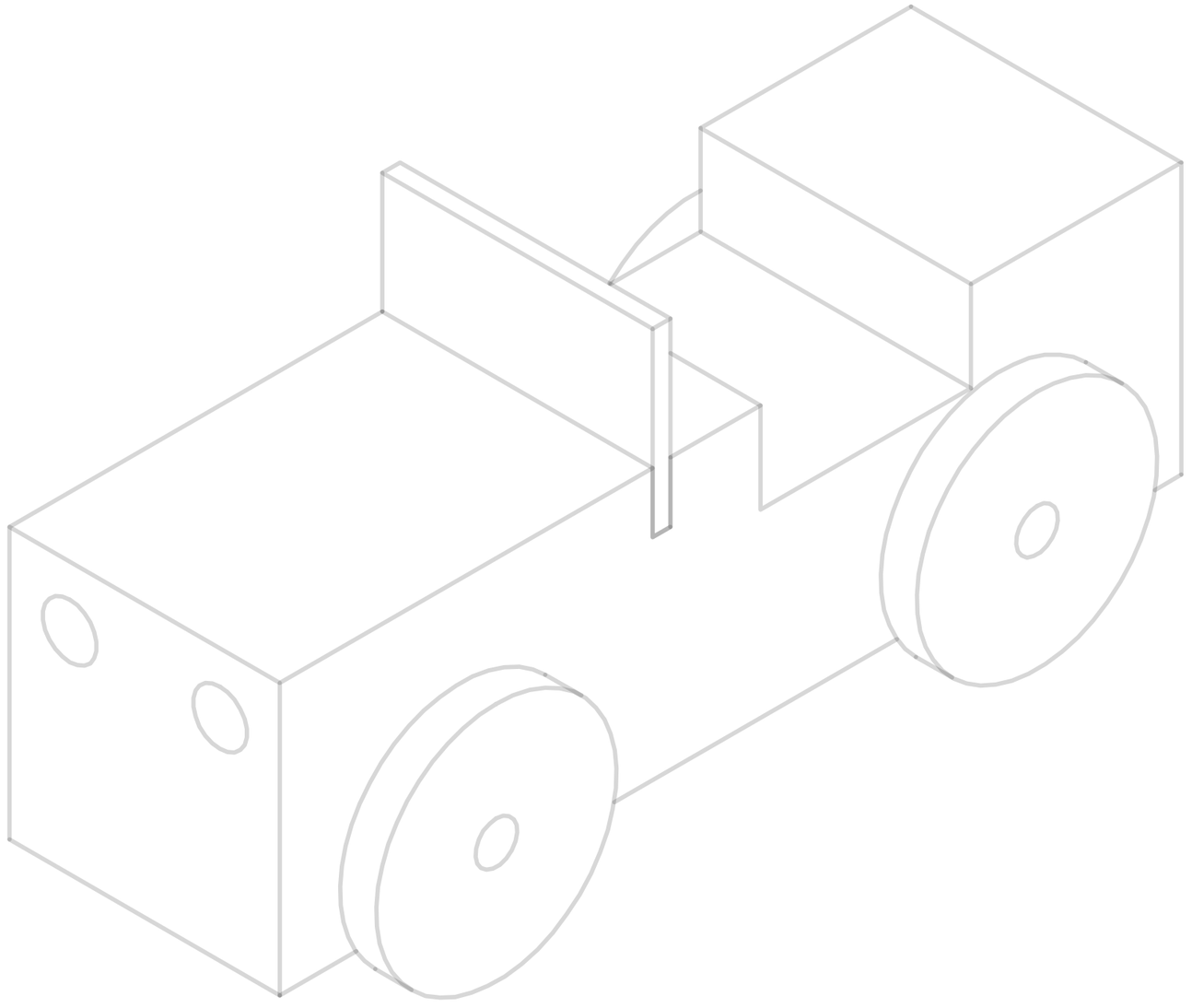
ACTIVITY 3

FINAL DESIGN PROPOSAL

Draw your final design below, either in 2D or 3D.
It should contain colour for the decoration and labels
to explain what features you have considered.



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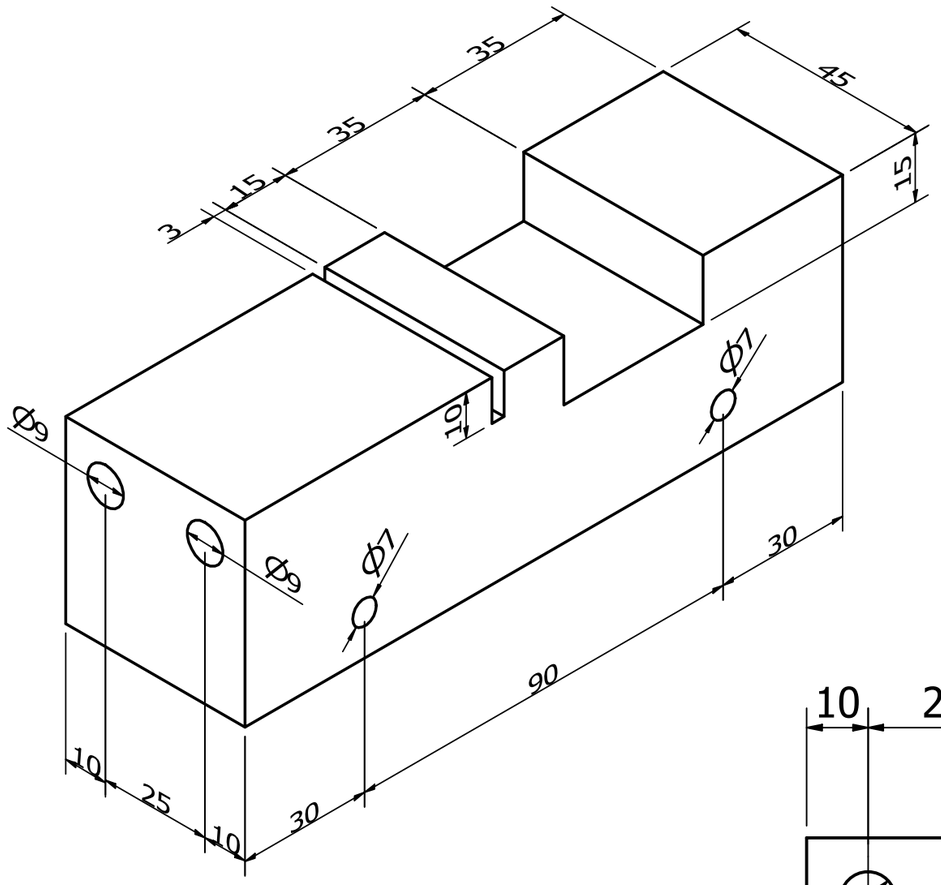
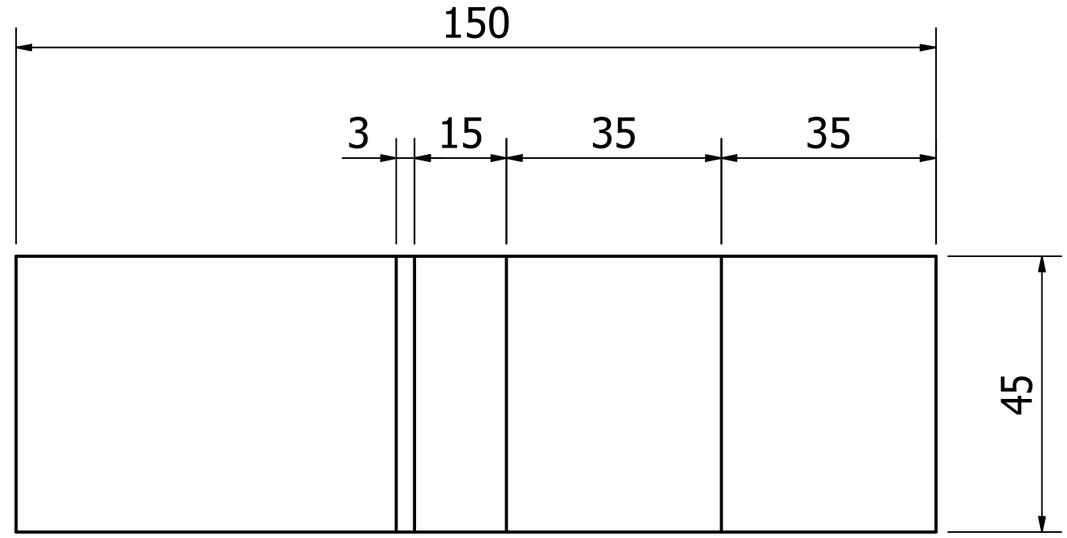
3D COMPUTER MODEL - ACTIVITY 4

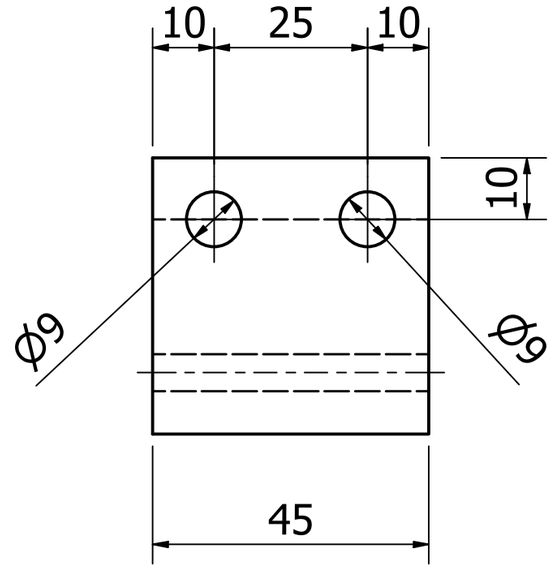
Your teacher will demonstrate how to use Autodesk Inventor to model the basic design of the car.
You must then add your own features by using the basic tools, such as:
• 2D Sketch • Extrude (add/cut).



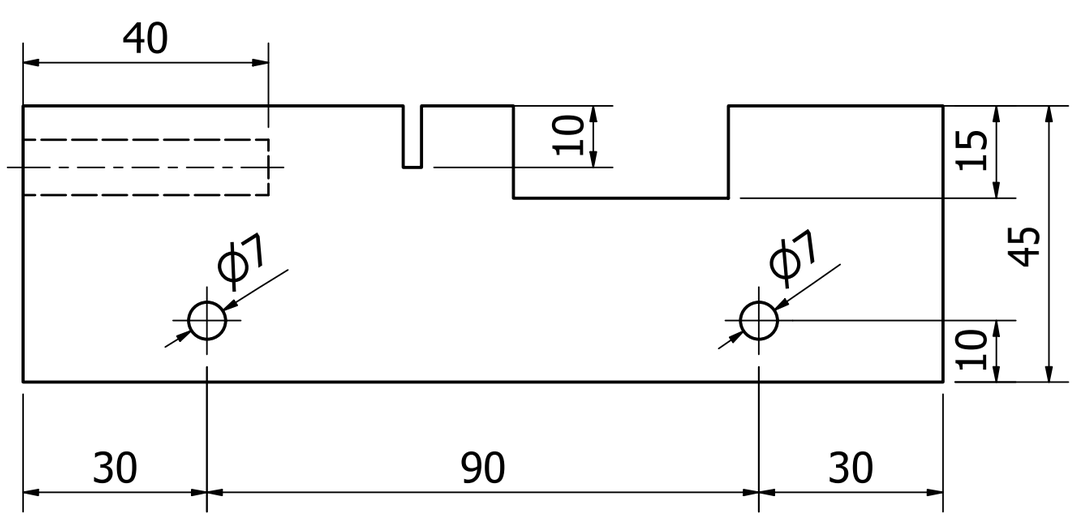
PICTORIAL



PLAN



END ELEVATION



ELEVATION

Some hidden detail has been removed for clarity.

Scale 1:1

Name Class	Boclair Academy Technical Department National 4 & 5 Graphics	Drawing Title Boclair Speedway Racecar Date	3rd Angle Projection

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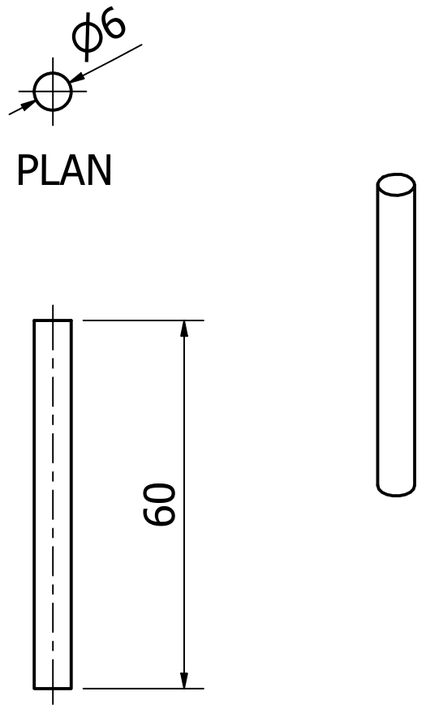
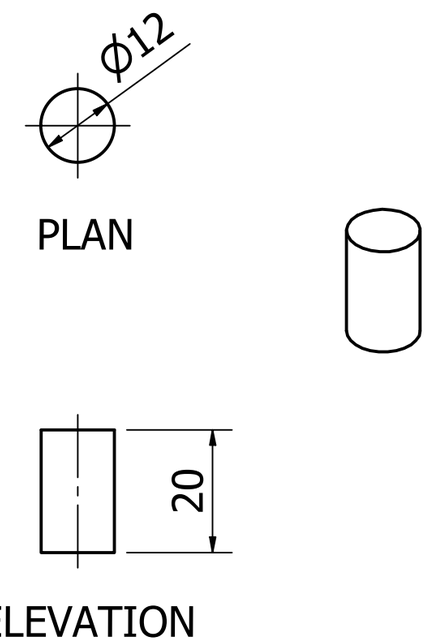
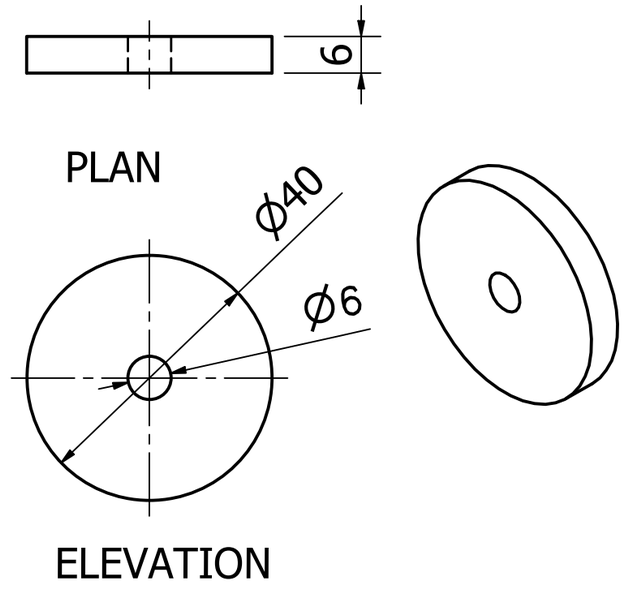
AXLE
Scale 1:1



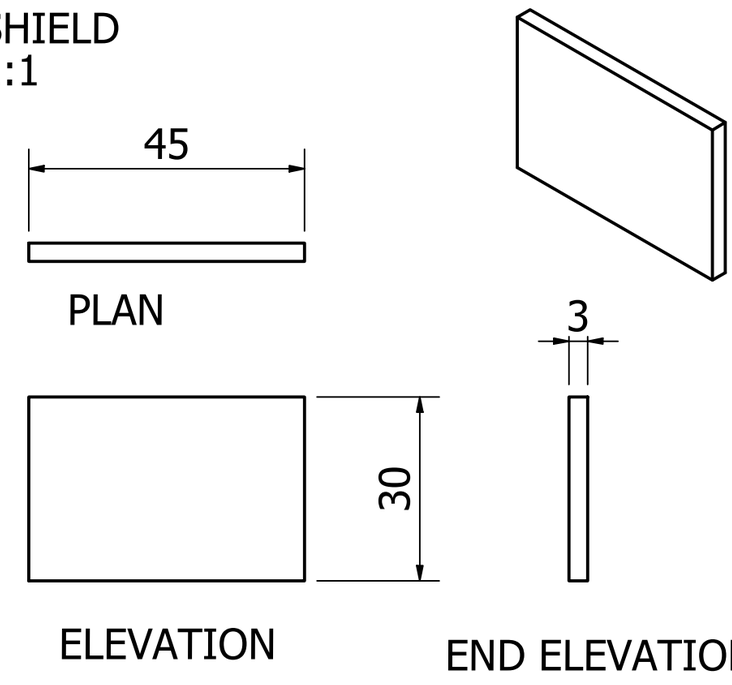
HEADLIGHT
Scale 1:1



WHEEL
Scale 1:1

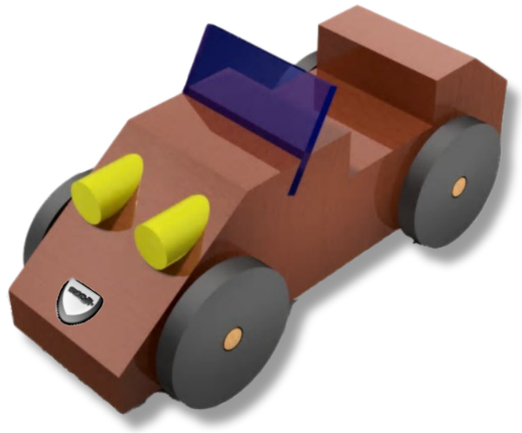


WINDSHIELD
Scale 1:1



3D ASSEMBLY & RENDER - ACTIVITY 5

- Now that you have modelled all the individual parts of the car, you must assemble them.
- Once assembled, apply a material to each part and then render it.
- Your teacher will demonstrate each stage to you in class.



Name	Class	Boclair Academy Technical Department	Drawing Title	3rd Angle Projection
		National 4 & 5 Graphics	Boclair Speedway Racecar Date	

Boclair Technical Speedway Car Race

LOGO DESIGN - ACTIVITY 6

TASK 1: In the spaces provided below, draw 3 different design ideas for your car's logo.

TASK 2: In Serif DrawPlus, create your logo using the various shape/line tools and add colour.

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ACTIVITY 7

PLAN FOR MANUFACTURE

In the space below, sketch and label the key stages for the manufacture of your toy car. Use the list on the right to help you and add any additional stages.

Key stages...

- Marking out on the wood
- Sawing and chiseling the seat
- Drilling the axles and headlights
- Saw the windshield
- Remove the shaped ends
- Finish the edges of the plastic
- Attach the headlights
- Decorate the car body
- Add the logo
- Attach the axles and wheels
- Attach the windshield

ACTIVITY 8, 9 & 10 WILL BE CONDUCTED IN THE WORKSHOP

Boclair Technical Speedway Car Race

EVALUATION - ACTIVITY 10

• It is important to test your prototype to see if it meets the points listed in the Design Specification. It also allows you to learn from any mistakes and improve the design.

• List each specification point and give yourself a mark out of 5 on the worksheet.
Next, write down any mistakes or criticisms you have of your craftship (how well and accurate you have made it).

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