

Candidate 1 evidence

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Total marks — 90
Attempt ALL questions

1. A graphic designer developed the logo for a dog grooming company shown below.



Preliminary planning strategies were used to create the logo.



- (a) Explain, giving two reasons, why graphic designers use digital thumbnails like the ones shown above.

2

- The digital thumbnails can be used to directly continue the design and create the final product
- Digital software provides greater freedom with more precision and control over things such as colour and placement with grid snapping and colour wheels
- Edits can easily be made without erasing work

1. (continued)

The raster image of the dog in the logo was captured using a camera and then edited digitally using graphics software.

- (b) Describe two ways the graphic designer can convert the raster image of the dog into a vector graphic.

2

* Exporting the file into a vector file such as an SVG

* Trace the outline using the pen tool to create a vector path

* Use the shape tool to fill in the area ~~then combined~~ then ~~combine~~ merge geometry and use outline and remove the fill

The logo will be used on printed and digital media.

- (c) Explain, giving two reasons, why colour space, text to vector and resolution are important considerations when producing the final logo.

- (i) Colour space Colour space must be considered as

2

continuity between RGB and CMYK must be ensured

to keep colours the same which can be done using external

It also must be considered as RGB has a wider

colour space than CMYK so some colours may not exist

in CMYK but do in RGB. Colours in RGB may not look the same when printed

- (ii) Text to vector This should be considered to ensure fonts

2

are all displayed the same and at the same quality

keeping all edges crisp. It also ensures that if any scaling

is done no ~~comp~~ quality is lost

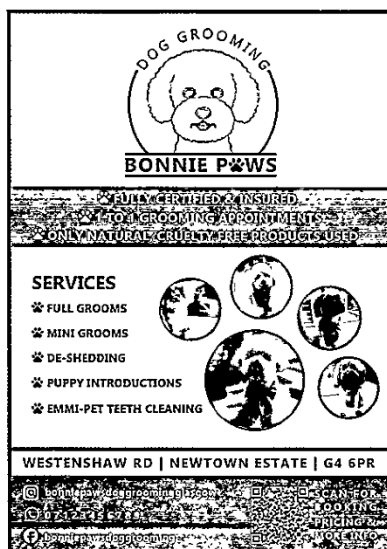
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		MARKS	DO NOT WRITE IN THIS MARGIN
1. (c) (continued)			
(iii) Resolution	This should be considered to ensure that the dimensions of the logo remain the same and are not stretched or warped. It also must be considered to ensure quality is kept the same when viewing printed and digitally ensuring everything is correctly shown. It also should be considered if digitally smaller devices such as phones are used that everything is shown	2	
(d) Explain, giving two reasons, why the company protects the rights to their graphics.	- To prevent other people from using work they considered for free - To prevent the brand/company identity from being stolen/ impersonated (Protecting the company identity)	2	

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1. (continued)

A range of items produced by the company are shown below.



COMPANY FLYER



DEODORISER SPRAY

The company flyer was printed using four colour offset lithography.

- (e) Describe four setup requirements for four colour offset lithography that ensures the flyer is printed correctly.

4

- Ensure everything is aligned correctly
- Ensure file is in a format that can be understood
- Ensure colours are in the CMYK format
- Have ink correctly inputted
- Use densitometer bars and colour bars to make sure colours and density are correct

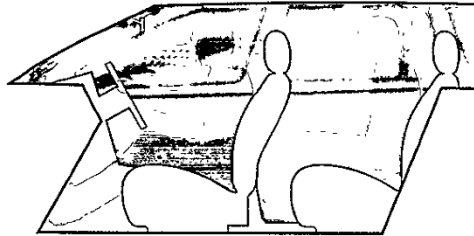
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	MARKS	DO NOT WRITE IN THIS MARGIN
1. (continued)		
(f) The logo on the deodoriser spray was vinyl cut using CAD/CAM and adhered to the bottle.		
(i) Identify a suitable file type that could be used for vinyl cutting.	1	
<u>DXF</u>		
(ii) Explain, giving two reasons, why this file type is suitable for vinyl cutting.	2	
<u>If translates everything into a path that the machine</u>		
<u>can follow</u>		
<u></u>		
<u></u>		
(g) Describe two ways the company could reduce their environmental impact producing the flyer and deodoriser spray.	2	
<u>The printer could use environmentally friendly inks or</u>		
<u>a laser printer could be used instead</u>		
<u>Laser printer could be used instead</u>		
<u>Use a material more eco-friendly than plastic vinyl</u>		
<u></u>		
<u></u>		

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2. The car industry uses modelling, digital testing methods, simulations, and 3D graphics.



CFD test of a ventilation system



artist's impression of ventilation airflow

- (a) Describe three ways that CFD simulations can assist with the design of car ventilation systems.

3

It allows the designer to see the full range of airflow before the design is produced saving money and time testing
It can allow the designer to locate areas of minimal or maximum airflow to help with adding new vents or removing vents to ensure an optimal design
~~It saves~~
It does not require specialists and advanced machines to perform a test
Edits can be easily made and retested ~~to save~~

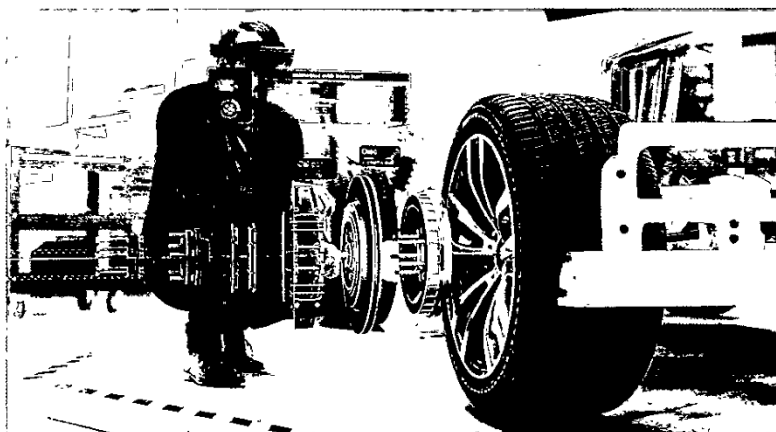
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2. (continued)

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Digital simulations were used when designing the braking system.



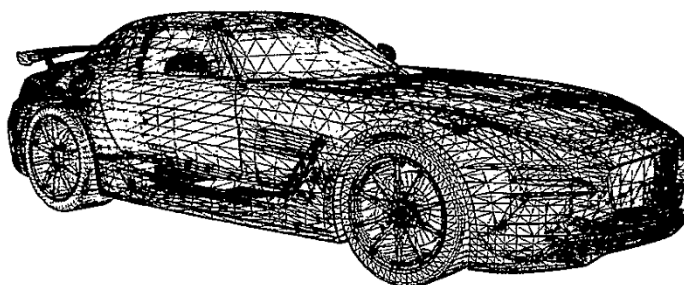
- (b) Describe two ways the use of digital simulations can reduce the car industry's impact on the environment.

2

Physical models do not need to be produced for each new design saving resources

No expensive tests need to be run as the computer does it
Saving electricity from big machines and saving energy

Polygons were used in the design of the car.



- (c) Describe two ways polygons were used in modelling the car body.

2

Polygons can help store data about the model efficiently and don't take up much storage

They can allow surface modelling to be used to wrap the model into an organic shape with smooth curves

2. (continued)

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Refer to supplementary sheet 1 for use with question 2 (d).

A promotional CAD illustration of a car design is shown on supplementary sheet 1.

- (d) (i) Describe, with reference to the image shown on supplementary sheet 1, one way each of the following illustration techniques have been used:

3

Image Based Lighting (IBL) Image based lighting has been used to show the reflection of the car's surroundings on the car's body

Specularity has been used on the bright shiny white reflections on the car's body to highlight its shiny glossy material helping it look more realistic and pleasing

Lighting has been applied onto the car to highlight and bring out its material too, it also helps light up the car to make it pop more and be a focal point

Desktop publishing can be used to further enhance illustrations and CAD renders.

- (ii) Describe, with reference to the image shown on supplementary sheet 1, two ways dynamic effects have been used.

2

A blur has been applied to the background and wheels to add depth of field and to make the car feel as if it is flying along the road very quickly

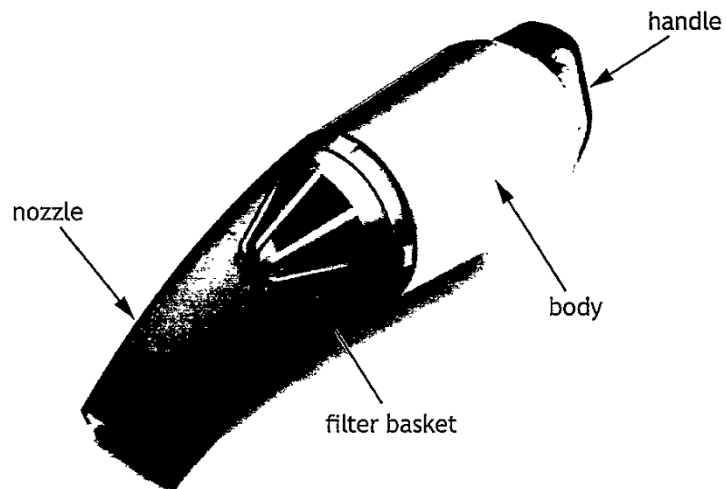
A glow has been added to the brake lights which helps them pop more and appear brighter and more realistic

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3. The design for a handheld vacuum cleaner is shown below.



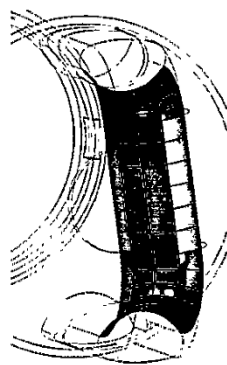
- (a) Describe the four stages you would carry out to create the handle using morphing (freeform modelling).

The images for each stage show what the component will look like at the end of the modelling stage.

You may use sketches to support your answer.

4

Stage 1

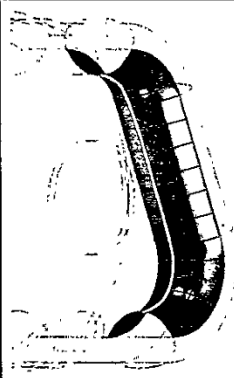


1. Convert the surface into a polygon mesh

3. (a) (continued)

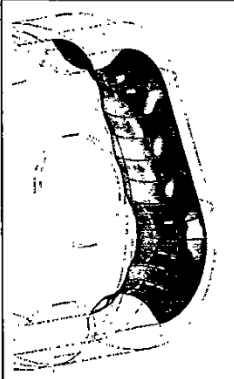
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Stage 2



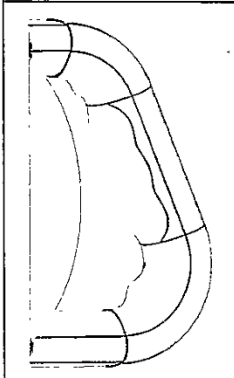
Select the faces/edges you would like to edit

Stage 3



Drag the polygons using edges and vertices to convert the mesh into the form you would like to create

Stage 4



Finish the mesh to convert it back into a solid surface

3. (continued)

The nozzle was created using a combination of surface and top-down solid modelling techniques.

Refer to supplementary sheet 2 for use with question 3 (b).

- (b) Describe, using 3D CAD modelling techniques, how you would model the nozzle. Refer to dimensions in your answer.

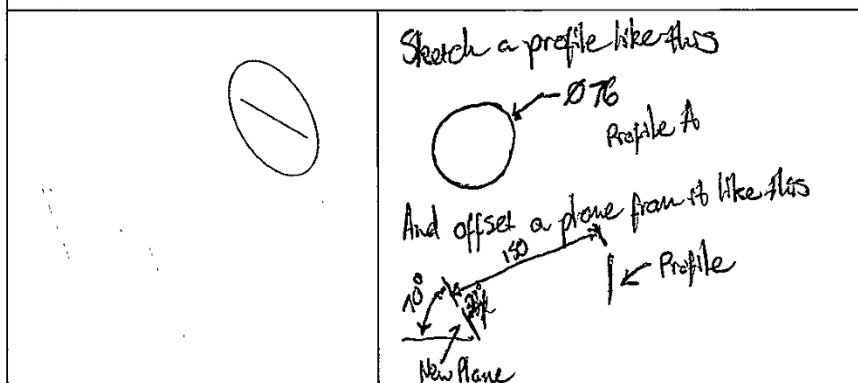
The images for each stage show what the component will look like at the end of the modelling stage.

You may use sketches to support your answer.

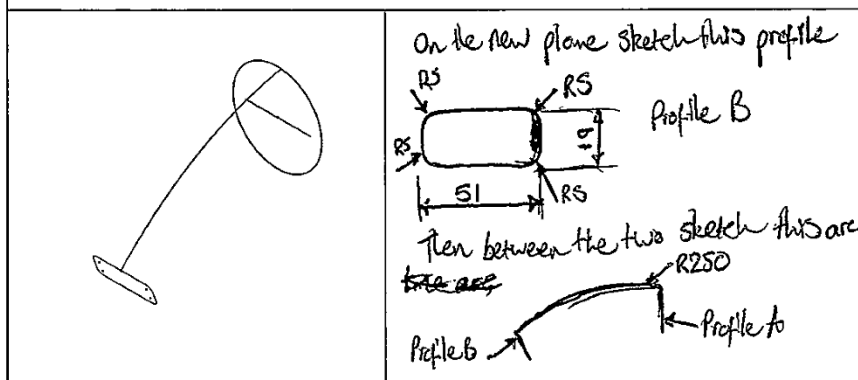
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6

Stage 1



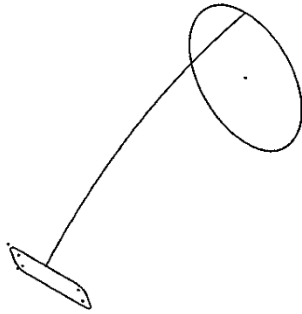
Stage 2



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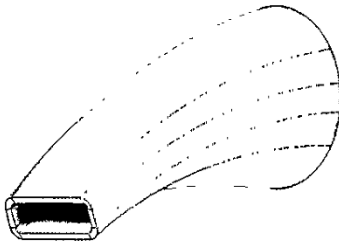
3. (b) (continued)

Stage 3



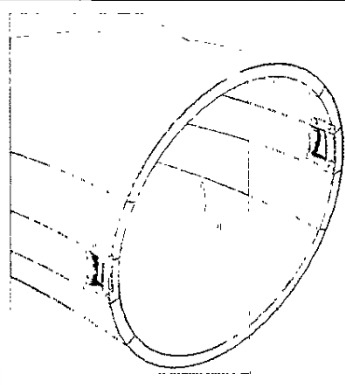
Then loft a surface between the 2 profiles using the arc as a rail

Stage 4



Then thicken the surface by 3.5mm inwards

Stage 5

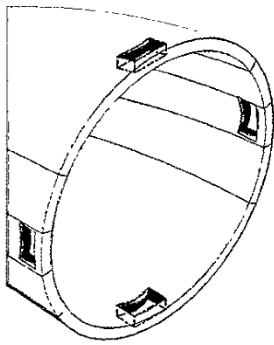


~~Create a plane perpendicular~~
Create a plane through the centre of the solid
New plane
Add sketch this profile
Edge A
R15
H 38mm
Then extrude
subtract both ways by 38mm
(Centre of profile must be 38mm from point B)
Elevation B
End Elevation

3. (b) (continued)

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Stage 6



Finally on the feature you just
extrude subtracted radial array
with a PCD: ~~100~~ 87.6 mm
Repeats: 4



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3. (continued)

The filter basket was created using solid modelling techniques.

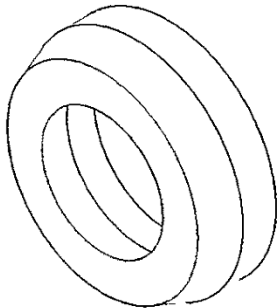
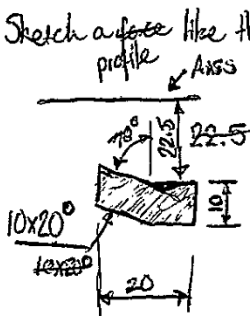
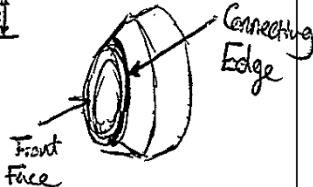
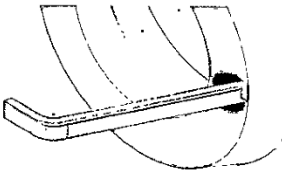
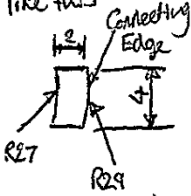
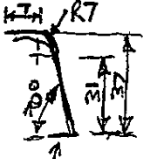
Refer to supplementary sheet 3 for use with question 3 (c).

- (c) Describe, using 3D CAD modelling techniques, how you would model the filter basket. Refer to dimensions in your answer.

The images for each stage show what the component will look like at the end of the modelling stage.

You may use sketches to support your answer.

6

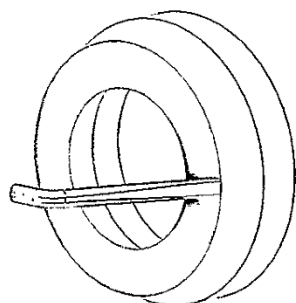
Stage 1	
	Sketch a face like this with an axis  And revolve 360° around the axis 
Stage 2	
	On the front face sketch a profile like this  Then perpendicular to the profile sketch this path  Then extrude the profile along the path using sweep  Profile

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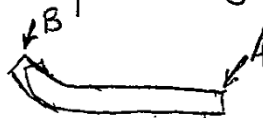
3. (c) (continued)

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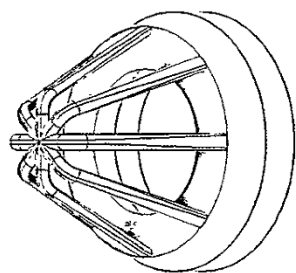
Stage 3



Then use an irregular fillet
on both edges with point B having
R1.5 and point A having R0.5



Stage 4



Finally select your feature and
radial array it

PCD: $\varnothing 65 \pm 0.35$

Repeats: 8

3. (continued)

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Refer to supplementary sheets 2 and 3 for use with question 3 (d).

- (d) Explain why symbols A to D are important for the manufacturer when manufacturing the handheld vacuum cleaner using CAD/CAM processes.

4

Symbol A This symbol lets the manufacturer know how the surface should be finished providing the correct roughness or smoothness of the product

Symbol B This symbol allows the manufacturer see where the centre of mass is allowing them to locate areas of instability to add supports to, preventing any failures

Symbol C This symbol allows the manufacturer to see the limits of how large or small a dimension can be to ensure proper function of the ~~sorter~~ filter basket

Symbol D This symbol allows for the manufacturer to have a point to have all dimensions parallel from to ensure they all stay at an appropriate size during production if any movement happens

FEA testing will be carried out on the handheld vacuum cleaner.

- (e) Describe four setup requirements that ensure FEA tests can be carried out accurately.

4

- Fixed points must be added where the model meets the ground
- A force must be applied with direction and magnitude
- Materials must be applied to appropriate parts
- All parts must be fully constrained properly and correctly

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4. Images of a building restoration project are shown below.



Town planners, conservation bodies and quantity surveyors were involved in planning the restoration project.

(a) Explain, giving two reasons, why each professional would be required.

- (i) Town planners required to go get permits for construction 2
Help plan when construction occurs for minimal
disruption. Help plan for any extra buildings nearby and
can help with new roads, shops etc
- (ii) Conservation bodies Help conserve the original architecture 2
and structure of the building. Prevent any damages from
occurring to existing structures or land scape.
- (iii) Quantity surveyor required to figure out how many materials 2
are required to complete the project. Help plan for the
cost of the project's materials

4. (continued)

Underground, drainage and feature surveys were required for the success of the restoration project.

(b) Explain, giving two reasons, why each survey would be required.

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|-------|---|-------|--------------------------------------|
| (i) | Underground survey <u>This survey can help with the building of foundations by showing the materials of the ground below, they can also help show existing or previous uses of the ground to ensure a stable safe restoration</u> | 2 | |
| (ii) | Drainage survey <u>This survey can help with plumbing to show where pipes can be added to manholes, it can also help show where water such as rain may collect to help add precautions to prevent flooding</u> | 2 | |
| (iii) | Feature survey <u>This survey can help show where existing man made features are allowing for access roads to be created off existing roads, it can also show areas to avoid due to existing features being there</u> | 2 | |

[Turn over

4. (continued)

The restored building was turned into a range of luxury apartments.



LUXURY APARTMENT ILLUSTRATION

- (c) Describe two ways an interior designer would be involved in the design of luxury apartments.

2

Arrange Furniture and around to create the nicest looking
rooms and to create space
Decide where rooms go on the floor plan based on windows
and natural lighting etc

4. (continued)

Companies use VRML tours to sell properties.



- (d) Describe three advantages for society moving to digital systems such as VRML.

3

VRML does not limit the viewer by having a video
runtime

It allows interaction with surroundings such as walkthroughs
to provide more realistic interactive experiences providing
~~greater~~ detail for clients
greater

Allows for online viewings so people don't have to travel
all the way to a property

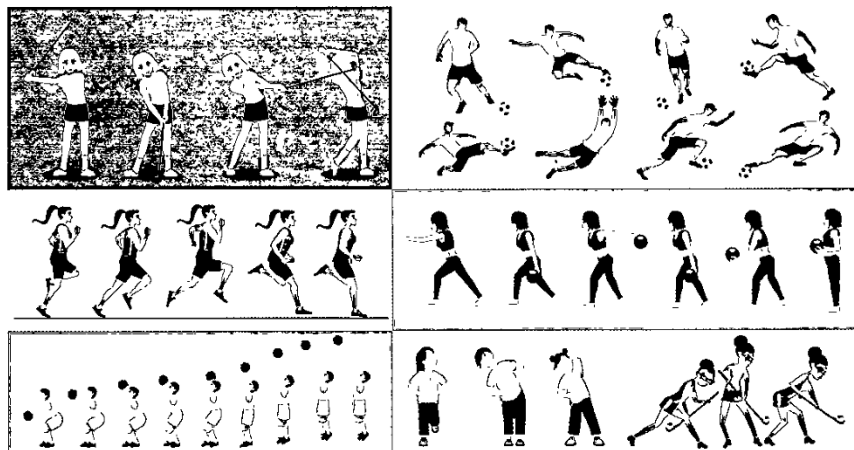
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5. An advertising company produces a range of digital animations and videos for businesses.

Their current project focuses on motion tweening animations that educate children on how to play different sports and games.

A series of screenshots from their animations are shown below.



- (a) Describe how motion tweening and post editing techniques can be used to support the production of the animations.

8

Motion Tweening

- Saves time creating each individual frame as you only need to create intermediate frames and paths for objects to follow instead of every frame
- Creates smoother animations as objects follow a path and the computer generates the rest

Post Editing Techniques

- ~~Editing~~ Transitions can be added to help with changing scenes and providing smoother views
- Overlays can be added to provide textual information (useful for deaf viewers)
- Soundtracks can be added to help play music related to the theme creating unity or can help add audio information for blind viewers

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5. (a) (continued)

• Subtitles can also be added to provide textual info for deaf viewers increasing accessibility

• Motion tweening is relatively cheap to produce compared to something like ~~stop motion~~ motion capture

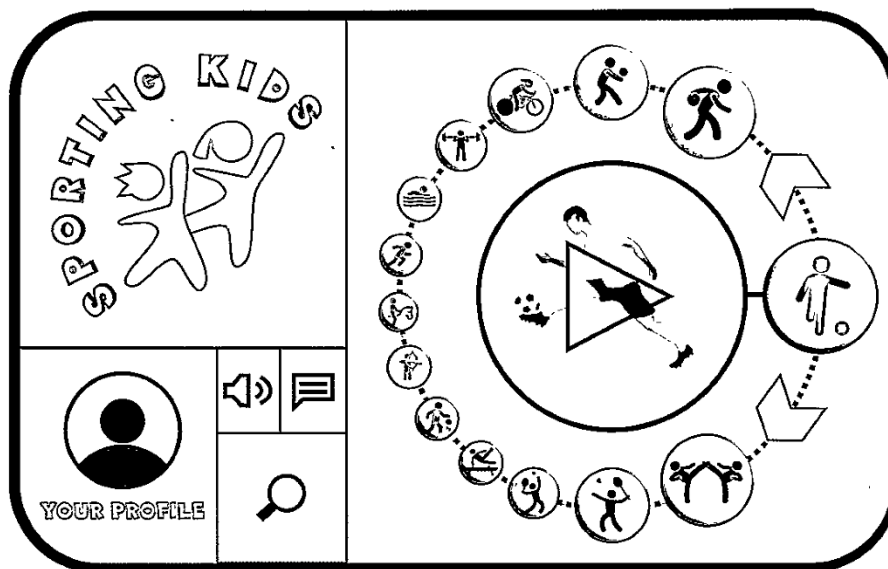
• Motion tweening does not require as much technical effort making it easier to produce

[Turn over]

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5. (continued)

The animations will be launched via an online app. The home screen from the app is shown below.



APP HOME SCREEN WITH SCROLLABLE NAVIGATION WHEEL

- (b) Describe, giving two reasons for each, how silhouettes and pace have been used to make the app accessible and easy to navigate for the young target audience.

4

Silhouettes have been used on the icons to create shapes that reflect the theme and provide information about each section. They have also been used on the arrows to help create a shape that helps point in the direction of scrolling and to help create a strong visible button to click.

Pace has been used on the ^{size of the} shrinking icons to help highlight the direction that scrolling will take you. Pace has also been used in the blue circle and line coming out of the selected icon to show that it is selected and being used.

5. (continued)

- (c) Describe how golden ratio has been used to design the layout of the home screen.

2

The golden ratio has been used on the boxes to place them in a shrinking ratio. It helps with the alignment of the boxes keeping a neat grid structure. It also helps balance the layout using the ratio to control the size creating a balanced pleasing look

To ensure the app works across a range of electronic devices the company will produce their animations using different video file types, including avi and 3gp.

- (d) Describe how each of these file types would be used to support playback on a range of electronic devices.

2

AVI is accessible by most computers and can be viewed there, 3gp can help with mobile devices. AVI is also a very compressed file meaning

[END OF QUESTION PAPER]