

2D Design CAD Xmas Bauble Tutorial

4 Purposes

In this project you will be working on your ability to become enterprising, creative contributors who;

- connect and apply their knowledge and skills to create ideas and products
- think creatively to reframe and solve problems
- identify and grasp opportunities
- take measured risks
- build up a body of knowledge and have the skills to connect and apply that knowledge in different contexts

Design Context

You are a new product designer working for a firm that specializes in designing unique products. Clients often come in asking you to complete a range of design proposals to meet their unique and unusual design briefs.

Design Task

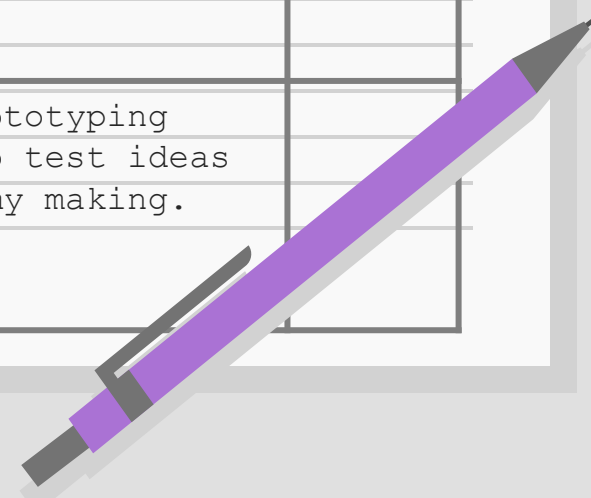
You are to complete a range of iterative CAD tutorials before being given a brief to redesign a product that can be flat-packed (laser cut) or 3D printed.



CAD

Grade Book

Progression step	Grade
I can develop my knowledge and skills to support and refine my design decisions in order to produce purposeful outcomes.	
I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.	
I can select and safely use appropriate tools, materials and equipment to construct purposeful outcomes.	
I can use prototyping techniques to test ideas and support my making.	



Time 40-50 minutes approximately

Level of Difficulty ★★★★★



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[@designoutthebox](https://twitter.com/designoutthebox)

<https://www.hawardenhigh.org.uk>
hmail@hawardenhigh.flintshire.sch.uk
 01244 526400



What's Next?

Complete all aspects of the project, please ensure that once you come to a MAD task you submit your work to your teacher for assessment. You must respond to all MAD tasks using the purple box assessment point. You will develop CAD skills that get progressively more complex enabling you to tackle the GCSE confidently

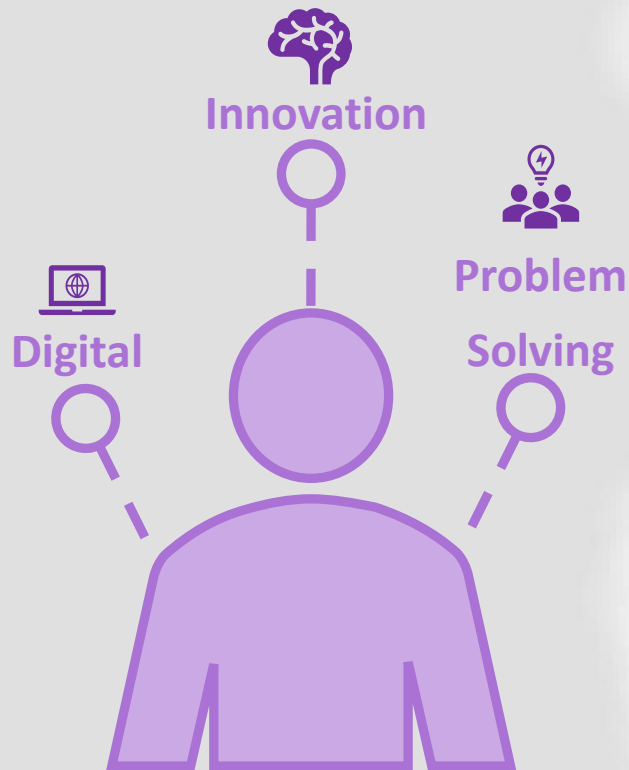
Progression Steps

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

I can select and safely use appropriate tools, materials and equipment to construct purposeful outcomes.

I can use prototyping techniques to test ideas and support my making.

Cross Curricular and Integral Skills



What is CAD?

How can we use research to design?

Can you identify the appropriate techniques in the correct order?

What was successful about the project?

What impact does CAD/CAM have on designing?

What H&S considerations must we have when laser cutting?

How could you improve it if you did it again?

CAD Intermediate Skills

CAD Basic Skills

CAD Advanced Skills

Making

Learning Outcomes

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CAD Skills Learning Journey

Statement of What Matters

Design thinking and engineering offer technical and creative ways to meet society's needs and wants.

By applying their experiences, skills and knowledge, learners can design and shape innovative engineered solutions. Being part of a user-centred design process will encourage them to use creativity to develop ideas, manage and mitigate risks, and minimise complexities. When engineering products, services and systems, they will need to understand and control the interactions between materials, structures, components and users. The application of engineering processes allows learners to develop accuracy, precision, dexterity and craftsmanship. By designing and engineering outcomes in response to needs and wants, learners can become enterprising problem solvers.

Progression Steps

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

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Find us at

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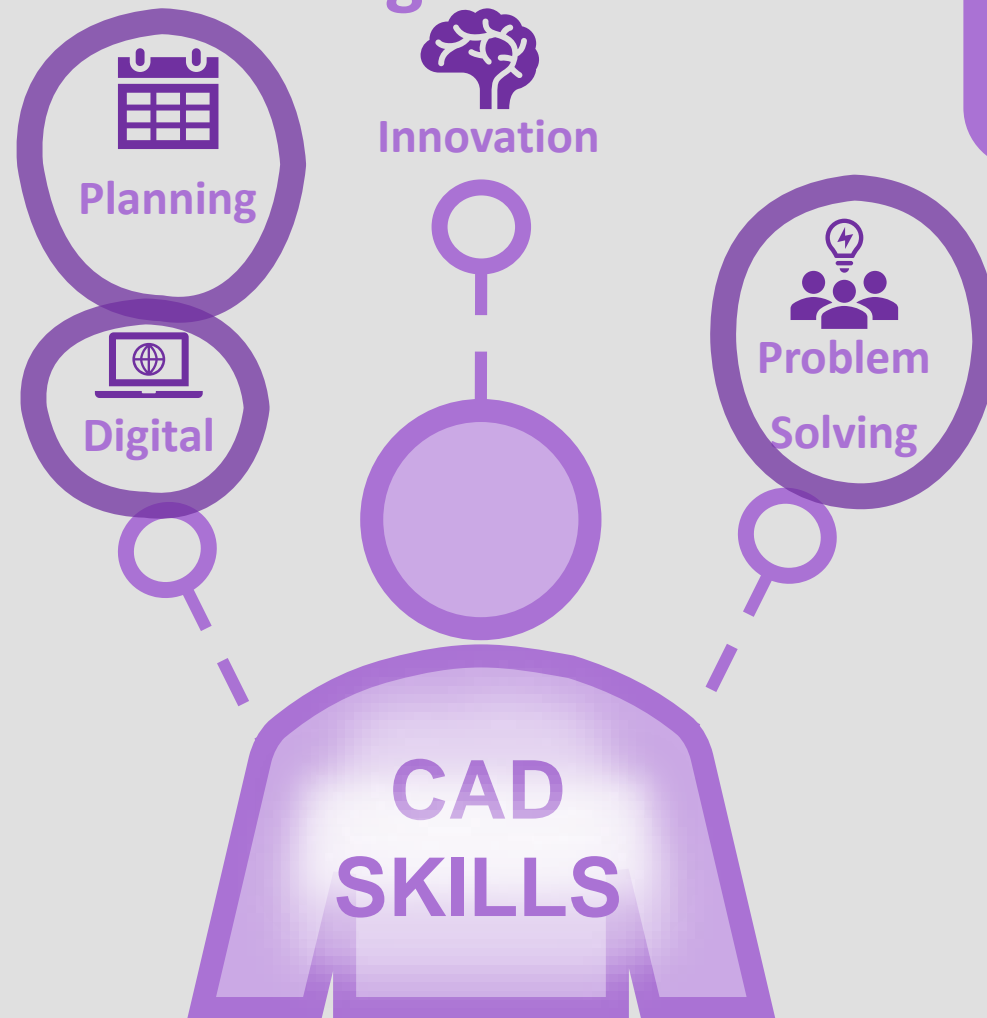
 hhmail@hawardenhigh.flintshire.sch.uk

 01244 526400



Hawarden High School
Ysgol Uwchradd Penarlâg

Cross Curricular and Integral Skills



4 Purposes

In this project you will be working on your ability to become enterprising, creative contributors who;

- connect and apply their knowledge and skills to create ideas and products

Learning Outcomes

- To develop advanced skills and problem solving skills when using 2D Design to draw and manufacture a 2D Christmas Bauble and a 3D Christmas Bauble to scale ready for laser cutting

What's Next?

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Innovation



Digital



Problem
Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



1. Engraved Christmas Tree Bauble


Innovation


Digital


Problem
Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

CAD Skills Checker

Learning Outcomes

- To develop advanced skills and problem solving skills when using 2D Design to draw and manufacture a 2D Christmas Bauble and a 3D Christmas Bauble to scale ready for laser cutting

By the end of this tutorial you will be able to...

- Import images
- Contour Bitmaps
- Draw a Christmas bauble using the correct size radius
- Using the skills you have learnt develop a 3D Christmas tree bauble
- Use the correct line colours to engrave and cut on a laser cutter

New Skills	Advanced Skills
Zoom tool <input type="checkbox"/>	Rotate tool <input type="checkbox"/>
Move tool <input type="checkbox"/>	Contour Bitmap tool <input type="checkbox"/>
Radius tool <input type="checkbox"/>	Vectorise Bitmap tool <input type="checkbox"/>
Line tool <input type="checkbox"/>	Text tool <input type="checkbox"/>
Rectangle tool <input type="checkbox"/>	Arc tool <input type="checkbox"/>
Circle tool <input type="checkbox"/>	Attach tool <input type="checkbox"/>
Eraser tool <input type="checkbox"/>	Contour tool <input type="checkbox"/>
Delete Part tool <input type="checkbox"/>	Line colour tool <input type="checkbox"/>



Innovation



Digital



Problem Solving

Progression Step

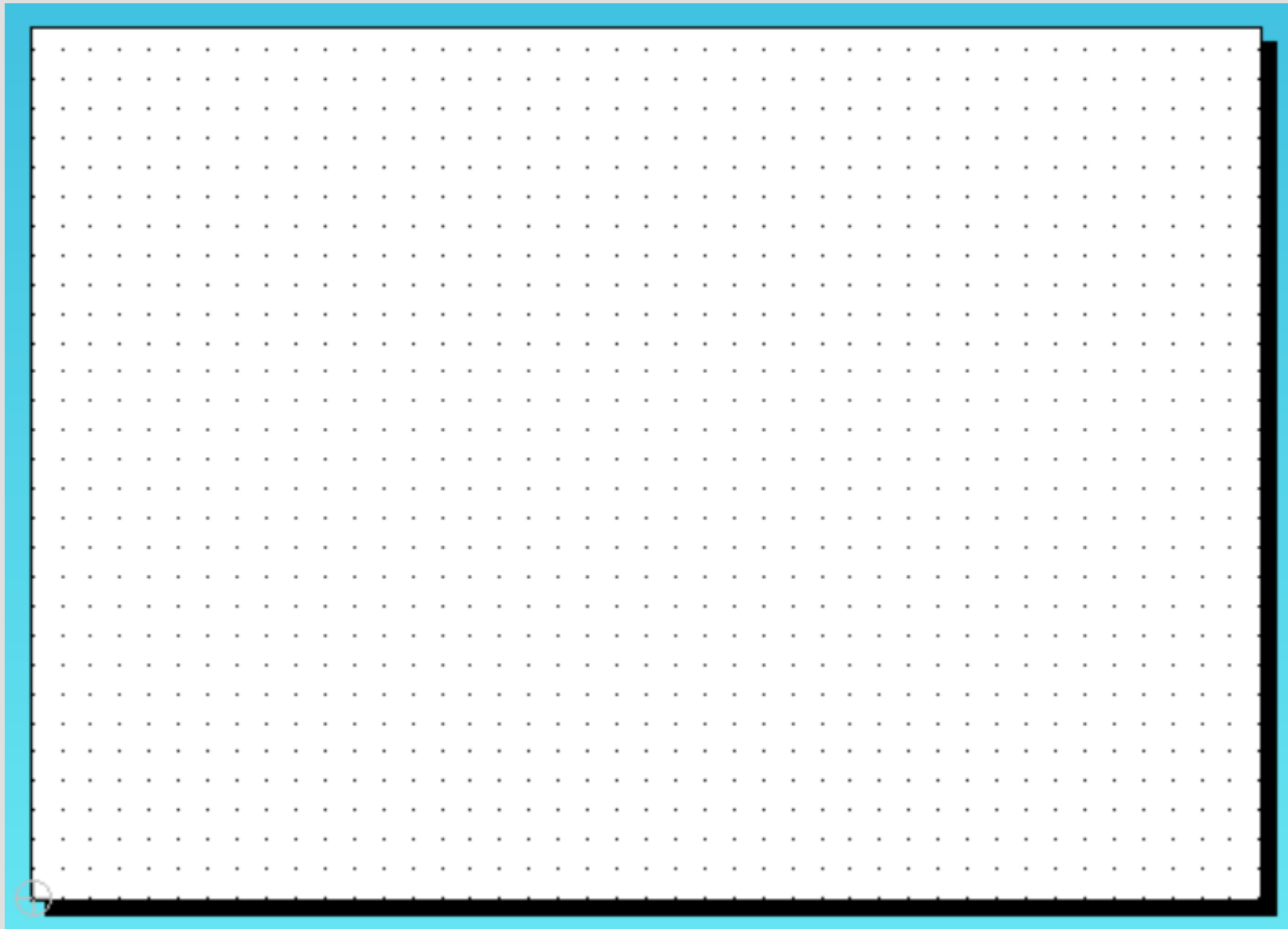
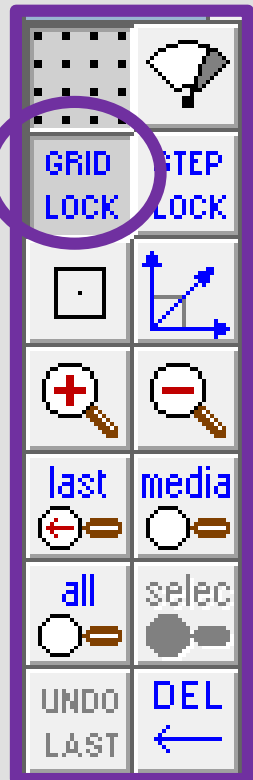
I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

- connect and apply their knowledge and skills to create ideas and products



1. Click the *grid lock tool* shown on




Innovation


Digital

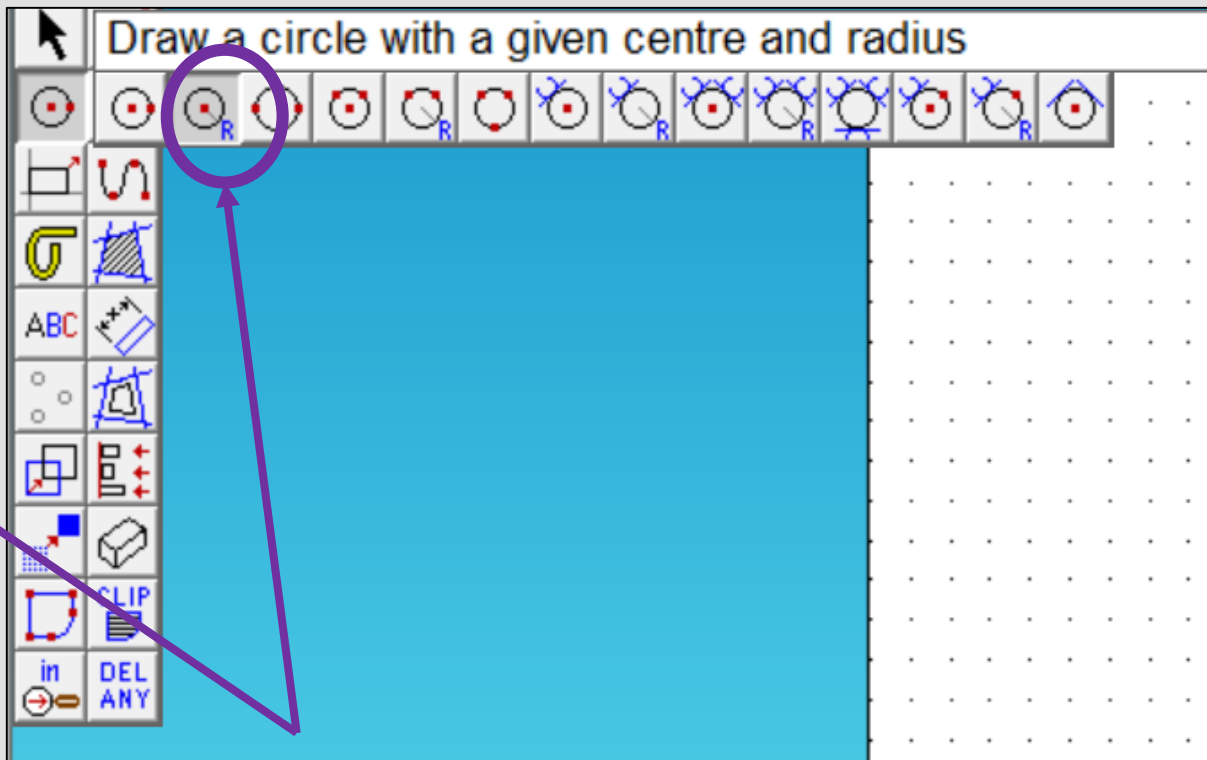
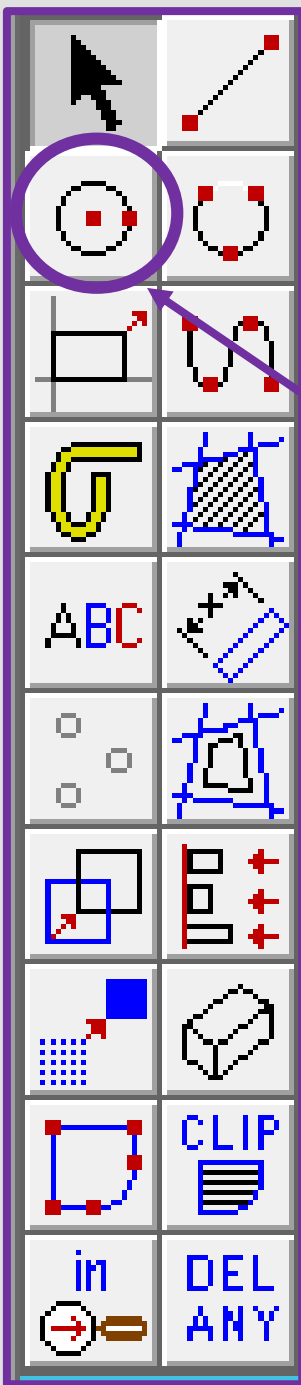

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

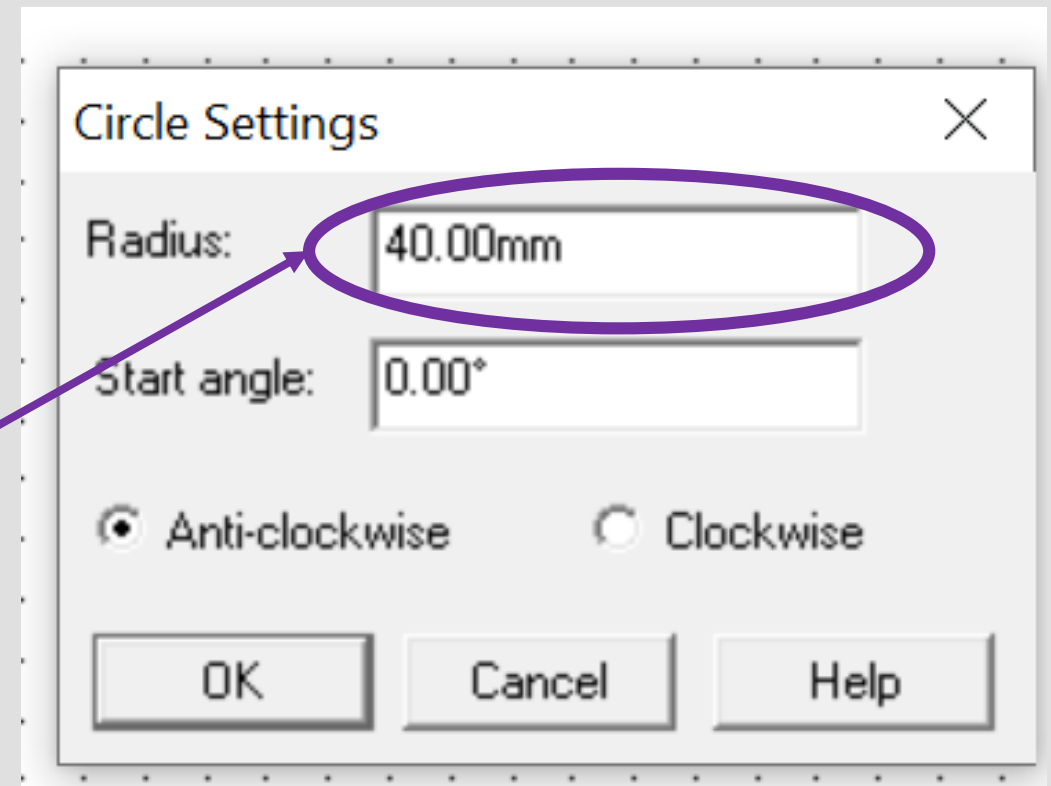
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



2. **Click** and hold on the *circle tool* until it extends out as shown above. Click on the second one in a circle with a **given centre and radius**

3. In the **circle settings** box type in **40.00** in the radius box and **press enter**



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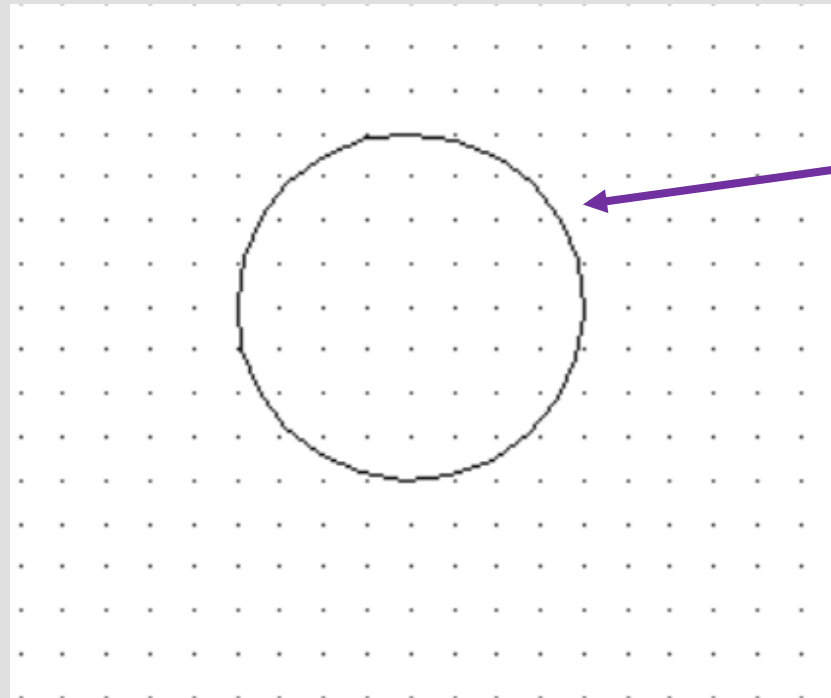
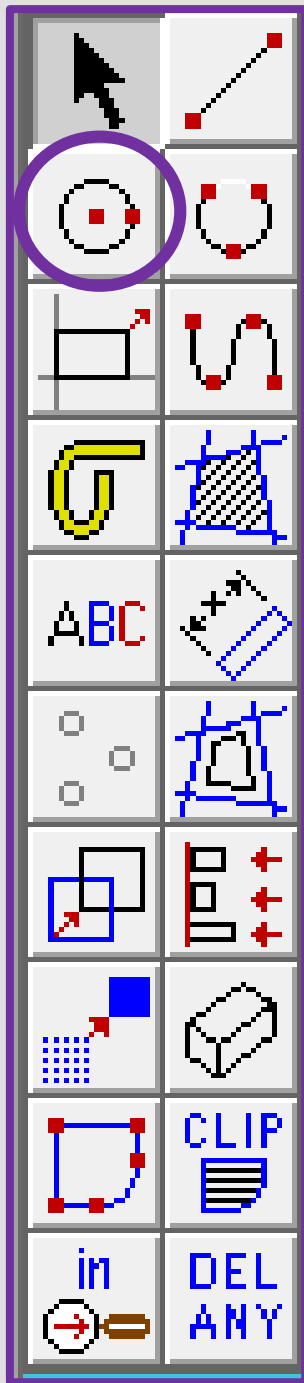
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

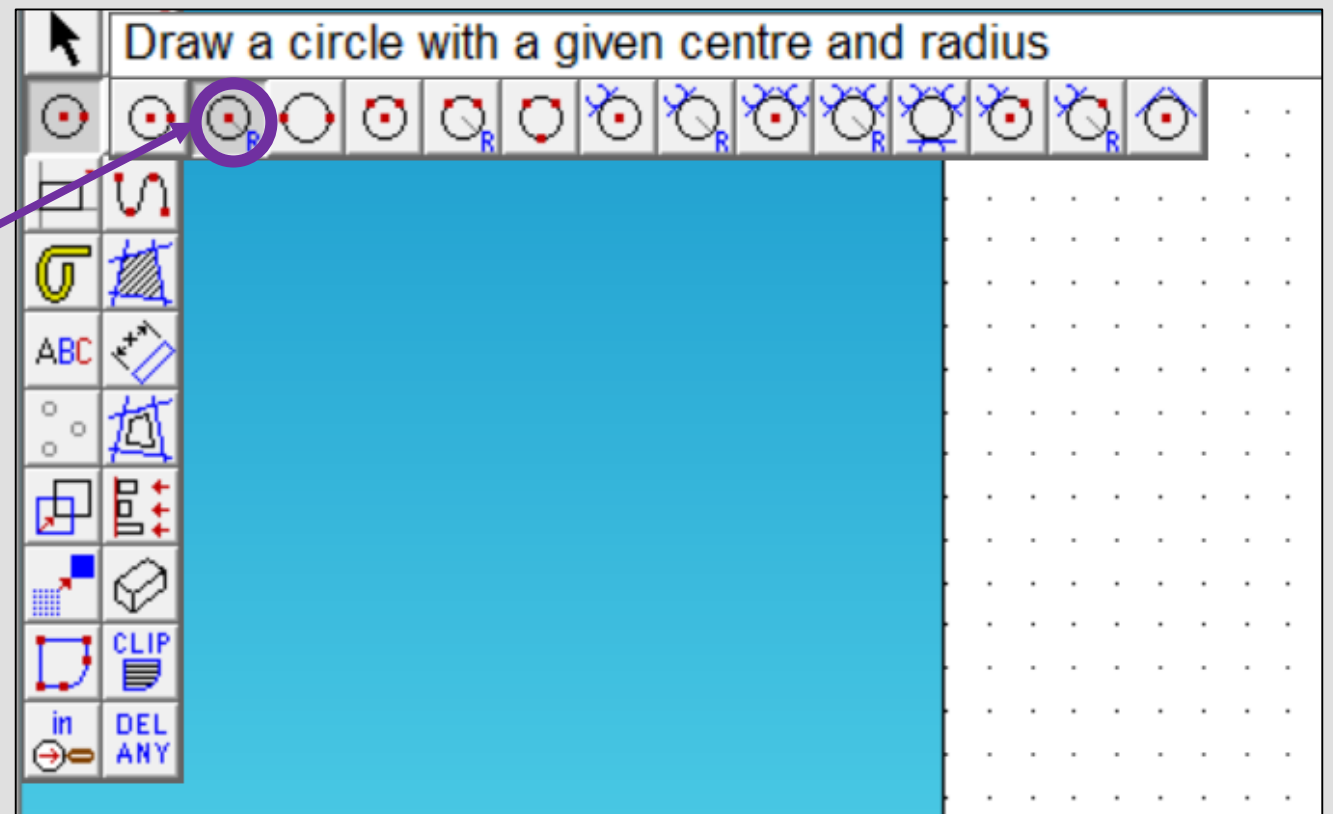
I can connect and apply my knowledge and skills to create ideas and products



4. Position the circle on the page.



5. Click and the circle with a **given centre and radius**. It should be selected from last time.

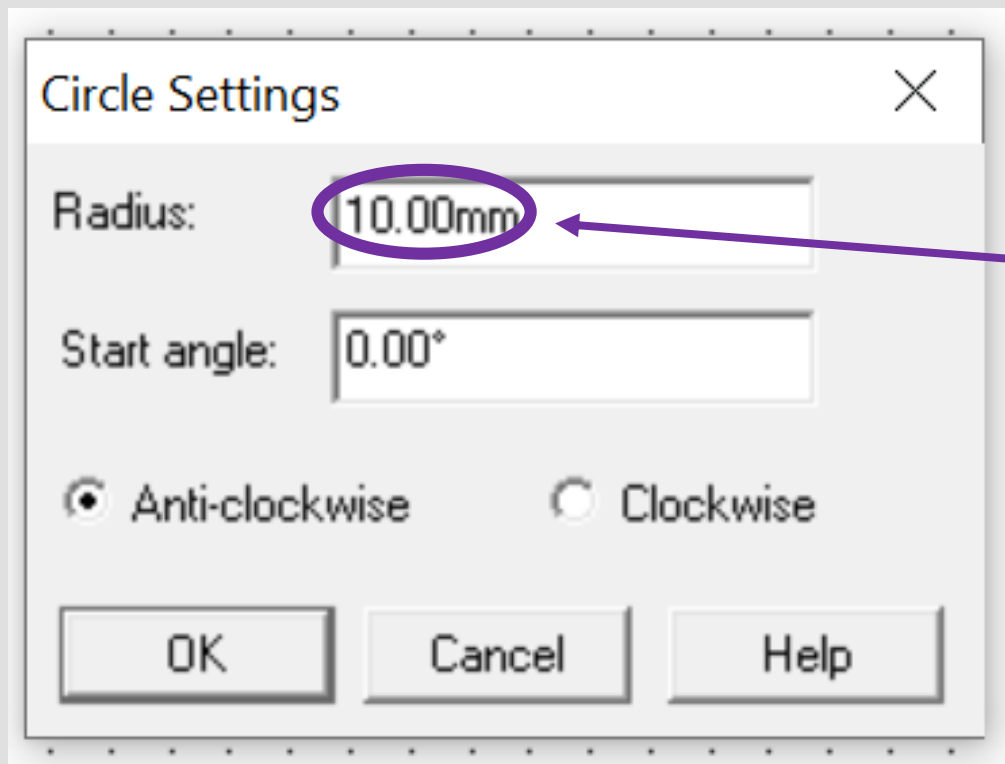
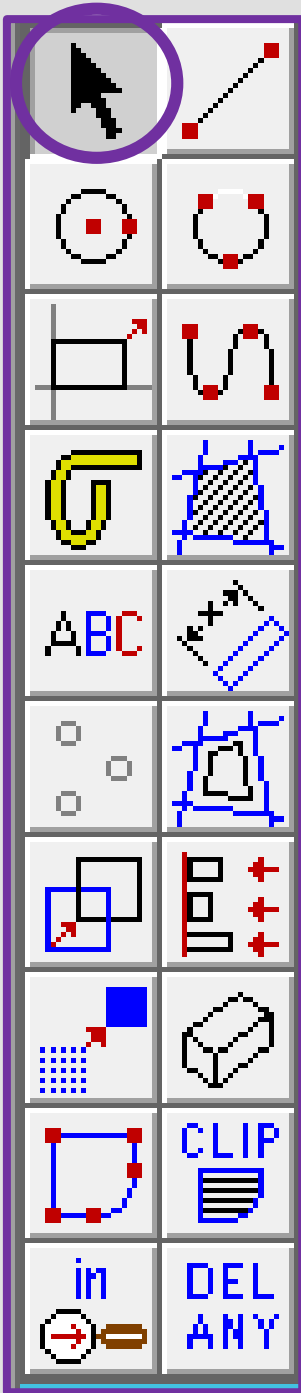


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

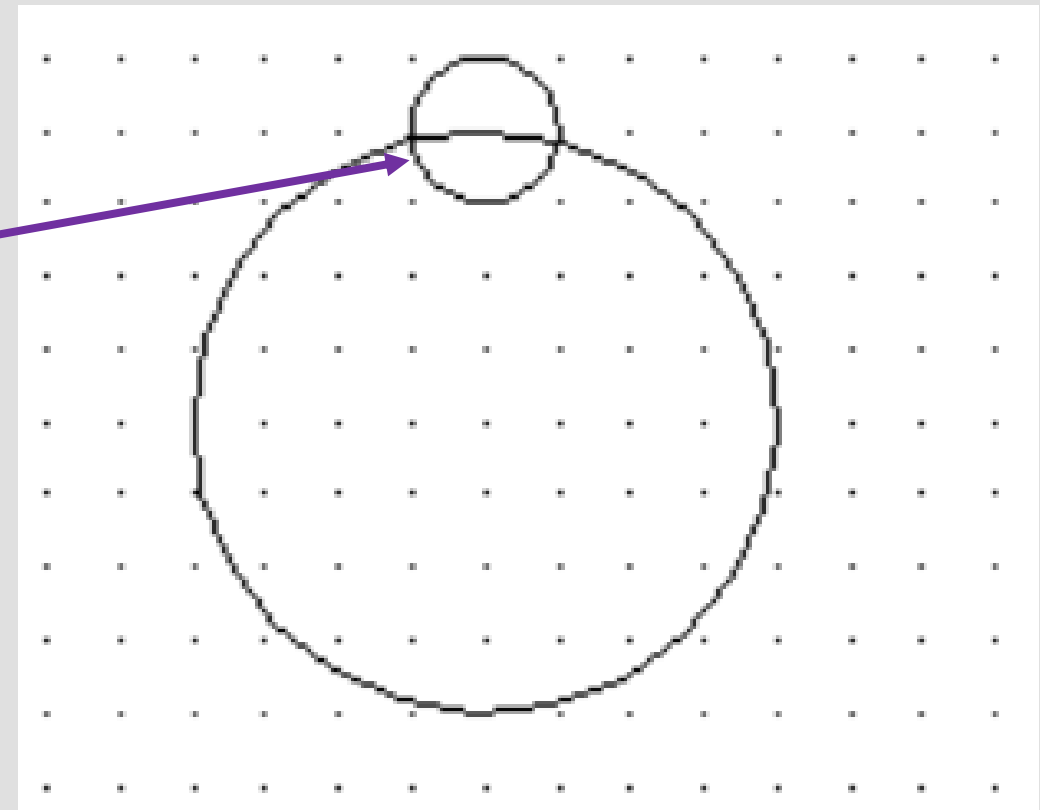
I can connect and apply my knowledge and skills to create ideas and products



6. In the **circle settings** box type in **10.00** in the radius box and **press enter**



7. **Position** the **circle** shown over the first circle shown opposite



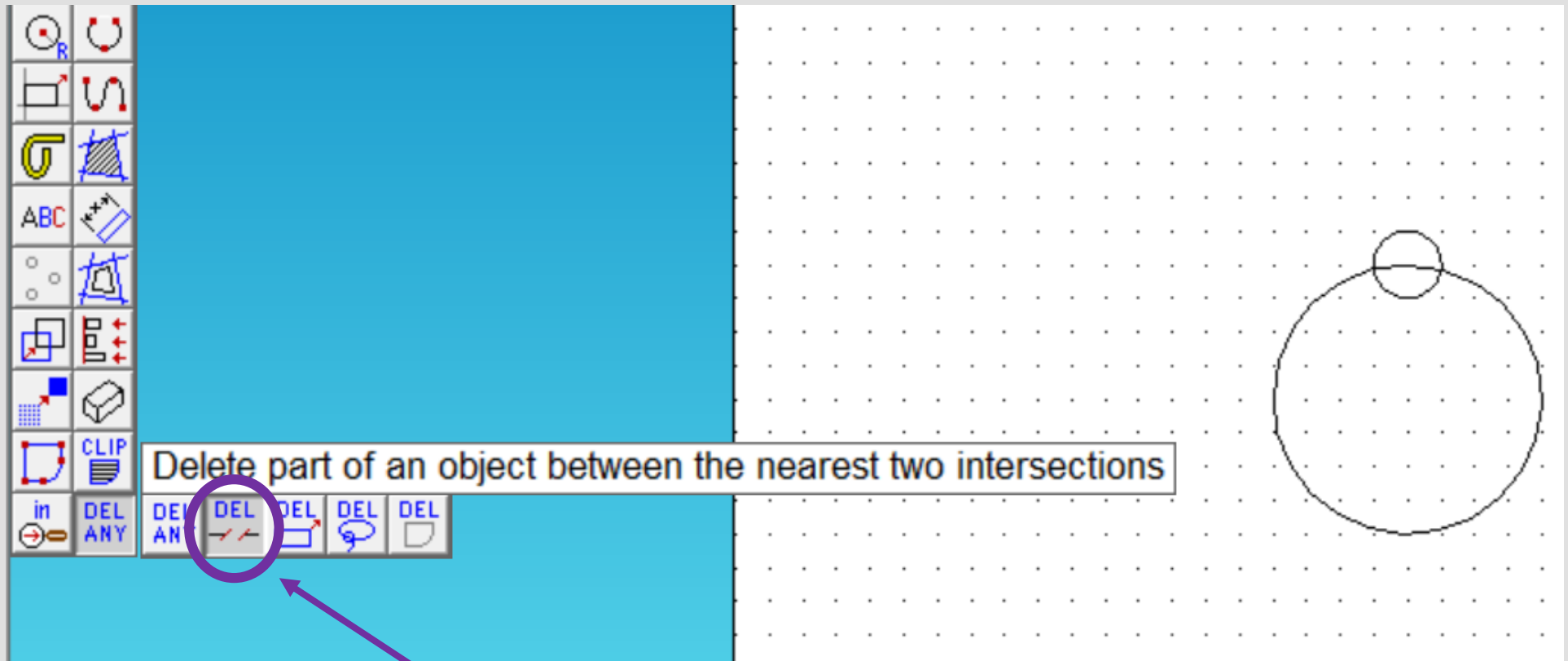

Innovation


Digital


Problem Solving

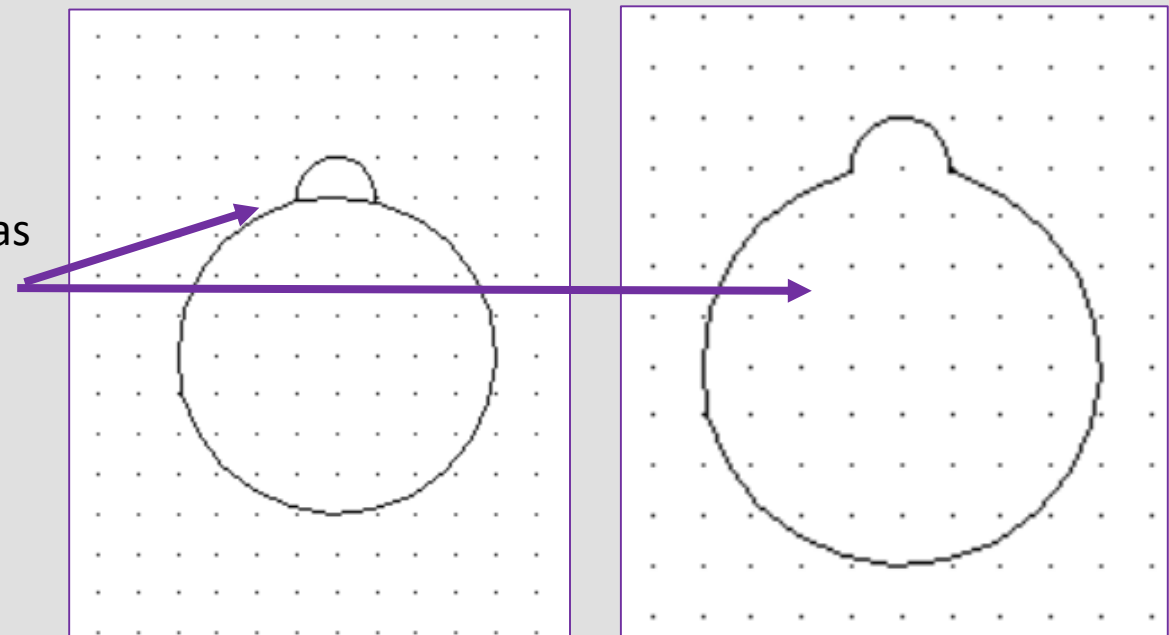
Progression Step
I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

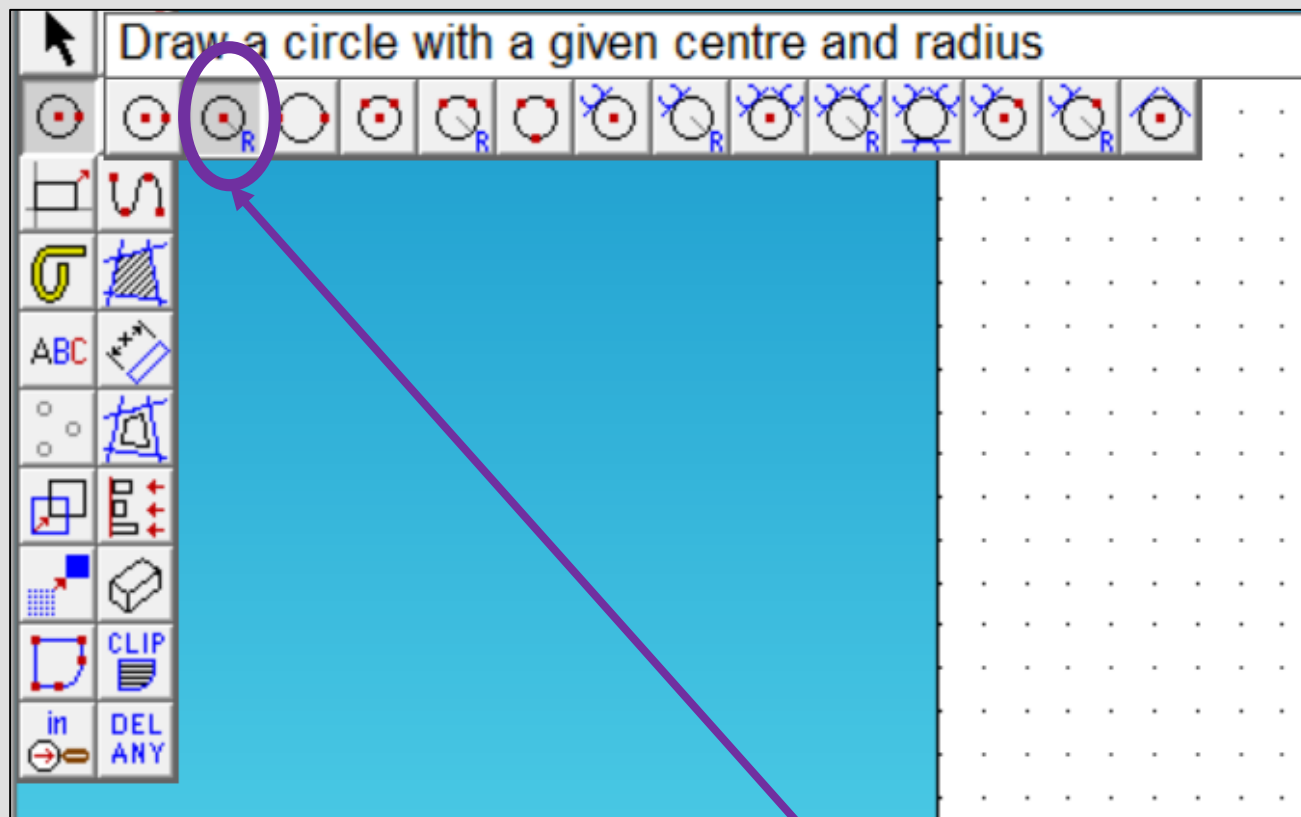
Learning Outcome
I can connect and apply my knowledge and skills to create ideas and products



8. Click and **hold** the **DEL ANY** toolbar down so it **extends** as shown. Click on **DEL PART**.

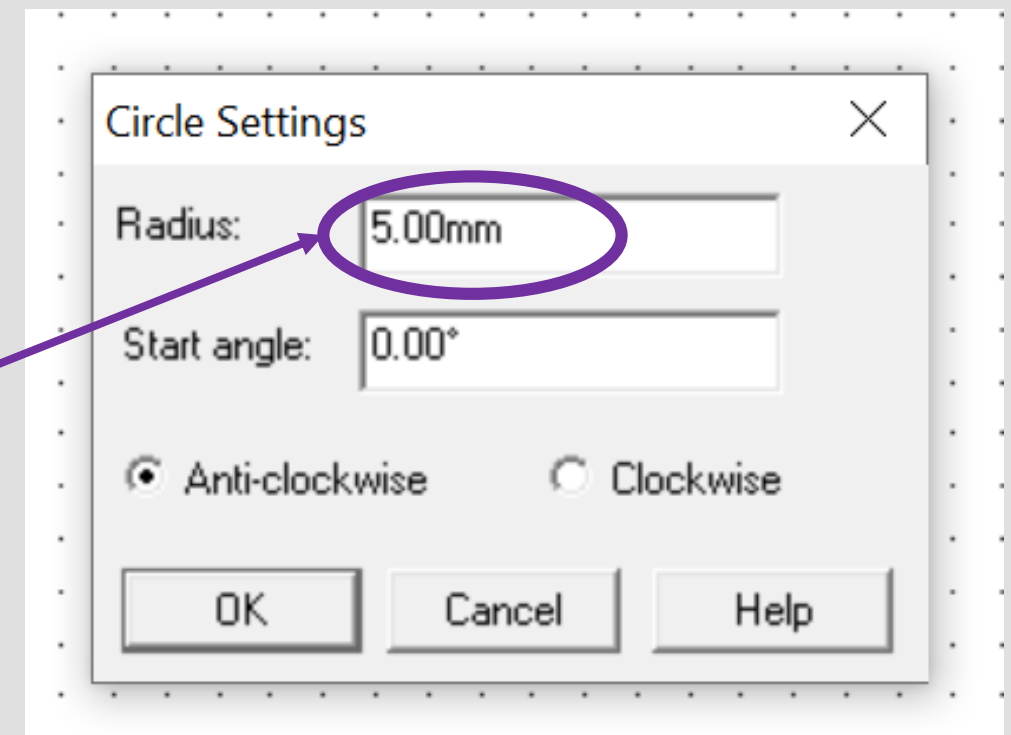
9. Using the **DEL PART** tool delete the intersecting lines to make one Christmas tree bauble shape as shown opposite





10. **Click** and the circle with a *given centre and radius*. It should be selected from last time.

11. In the **circle settings** box type in **5.00** in the radius box and **press enter**

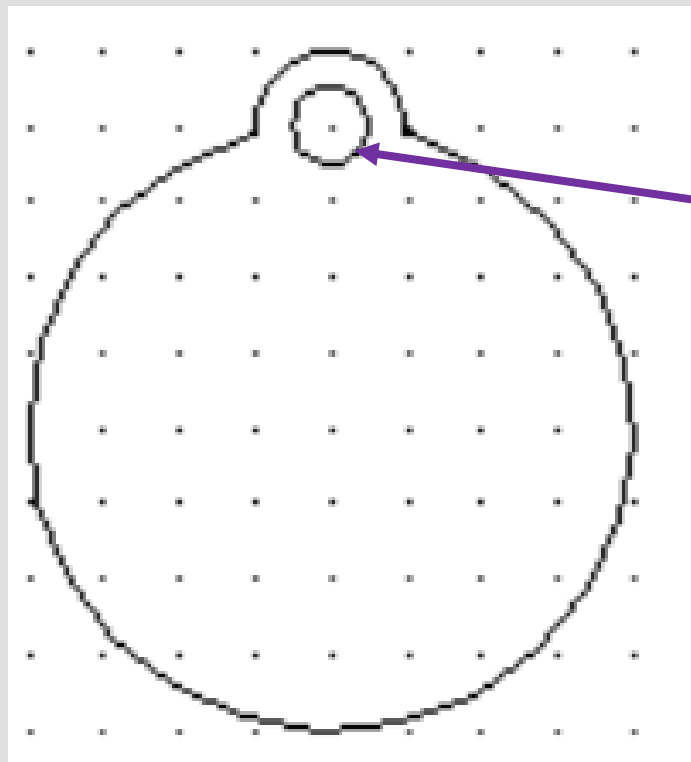


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products²



12. **Position** the **circle** shown in the circle shown opposite. This is the hole to attach string or push the branch of your Christmas tree through



13. Using google chrome search for a *merry Christmas silhouette*




Innovation


Digital

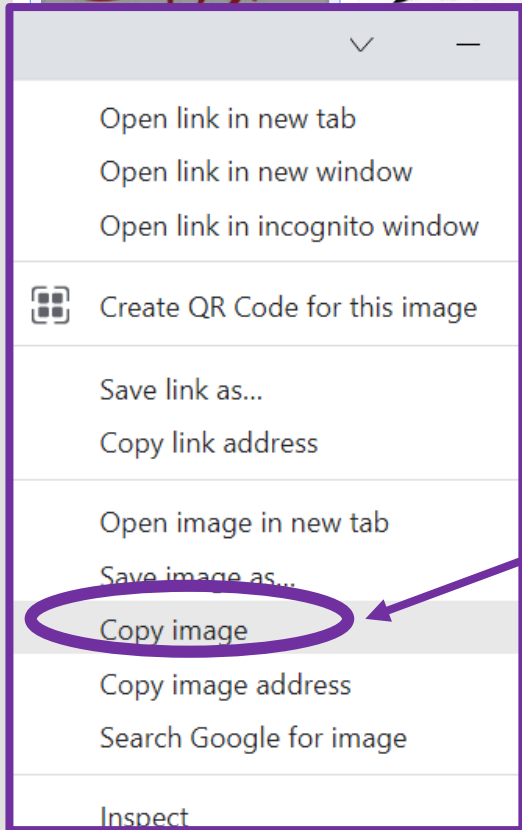
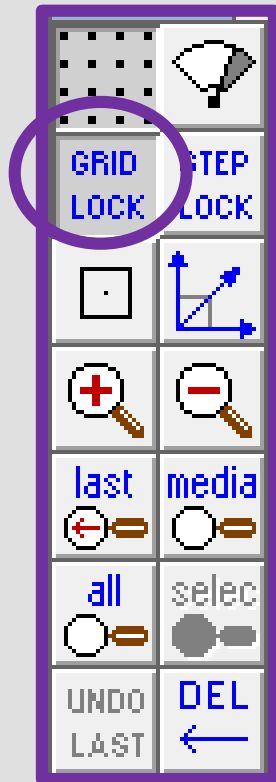
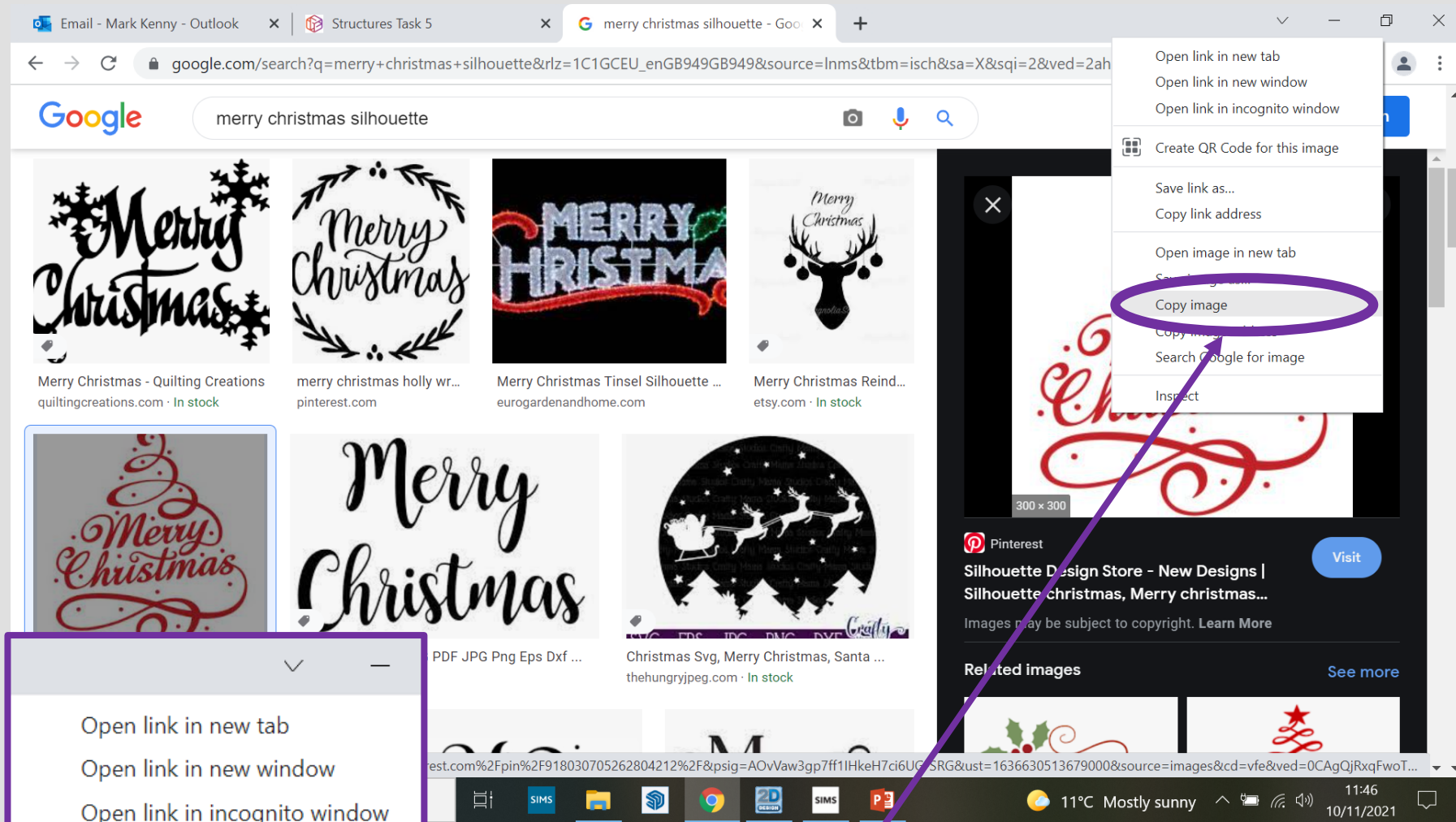

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



14. Once you have found a image you like. **Right click** and **Copy image**


Innovation


Digital


Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

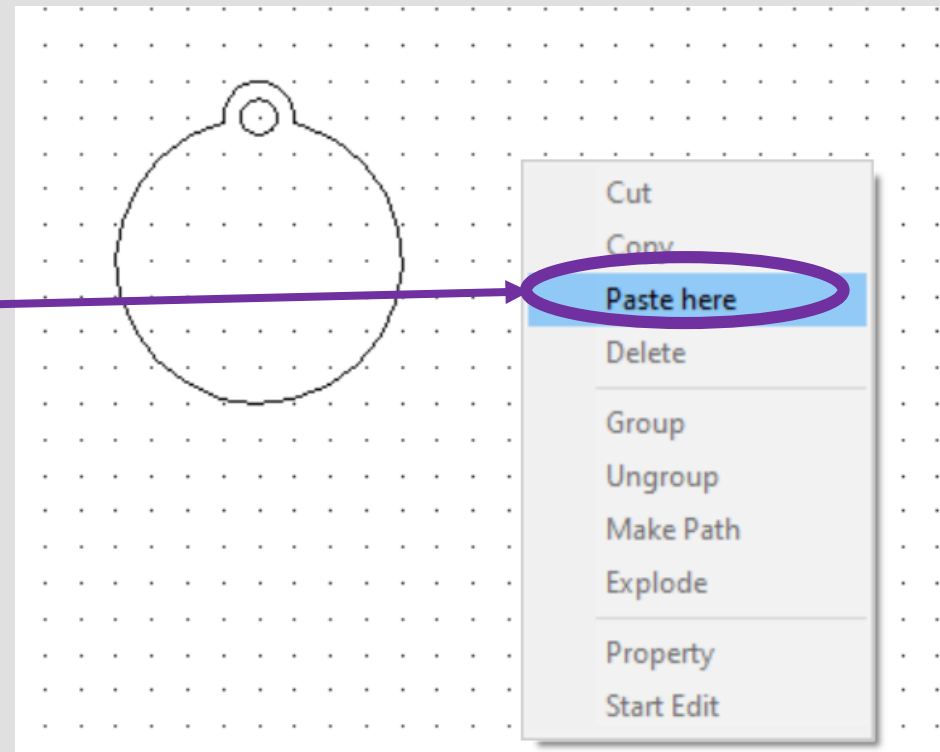
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



15. In **2D design** *right click* and *select paste* here.

Your image should copy straight into 2D design as shown below




Innovation


Digital

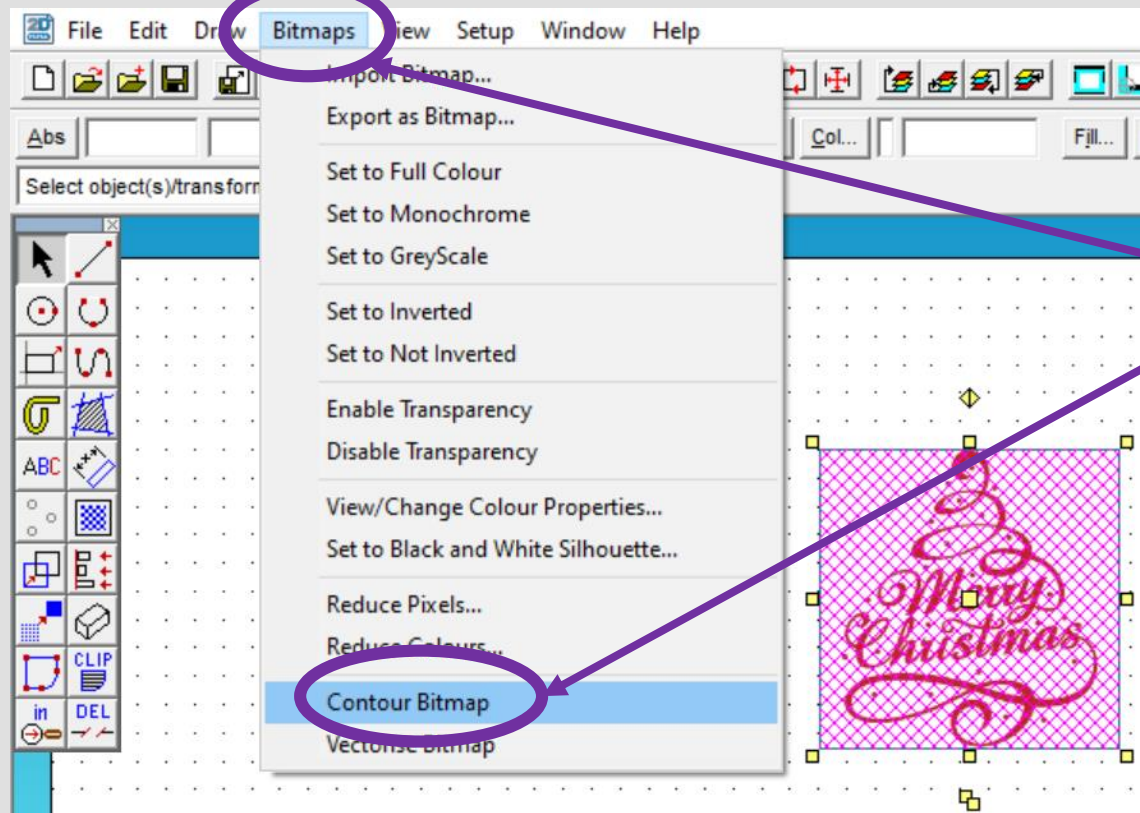

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

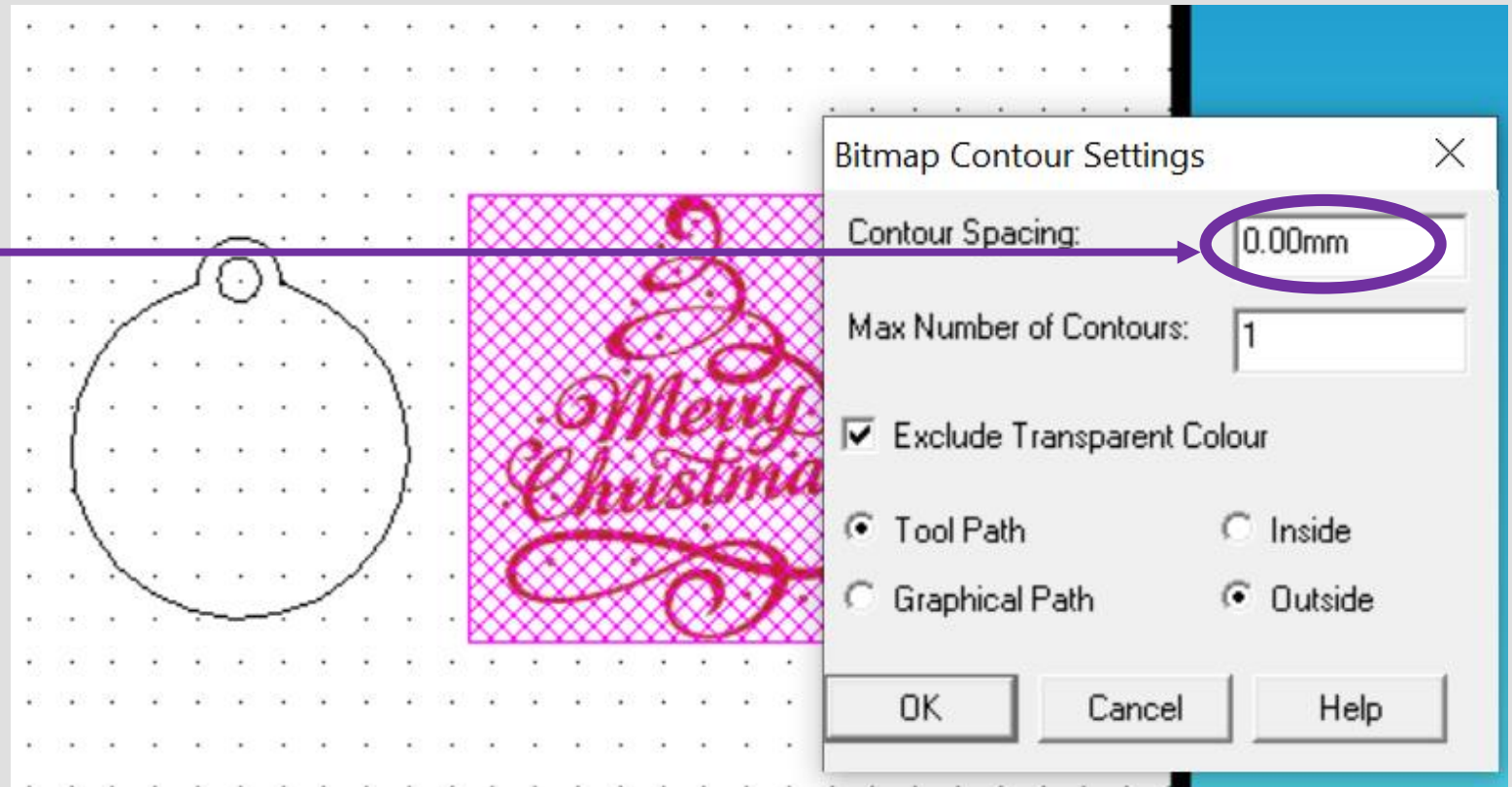
I can connect and apply my knowledge and skills to create ideas and products



16. **Select** the image and then the **bitmaps toolbar** shown on the top toolbar and in the circle shown opposite. Go down to **contour bitmap**



17. The **Bitmap Contour toolbar** shown will pop up. Change the **contour spacing** to 0.00



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Digital



Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

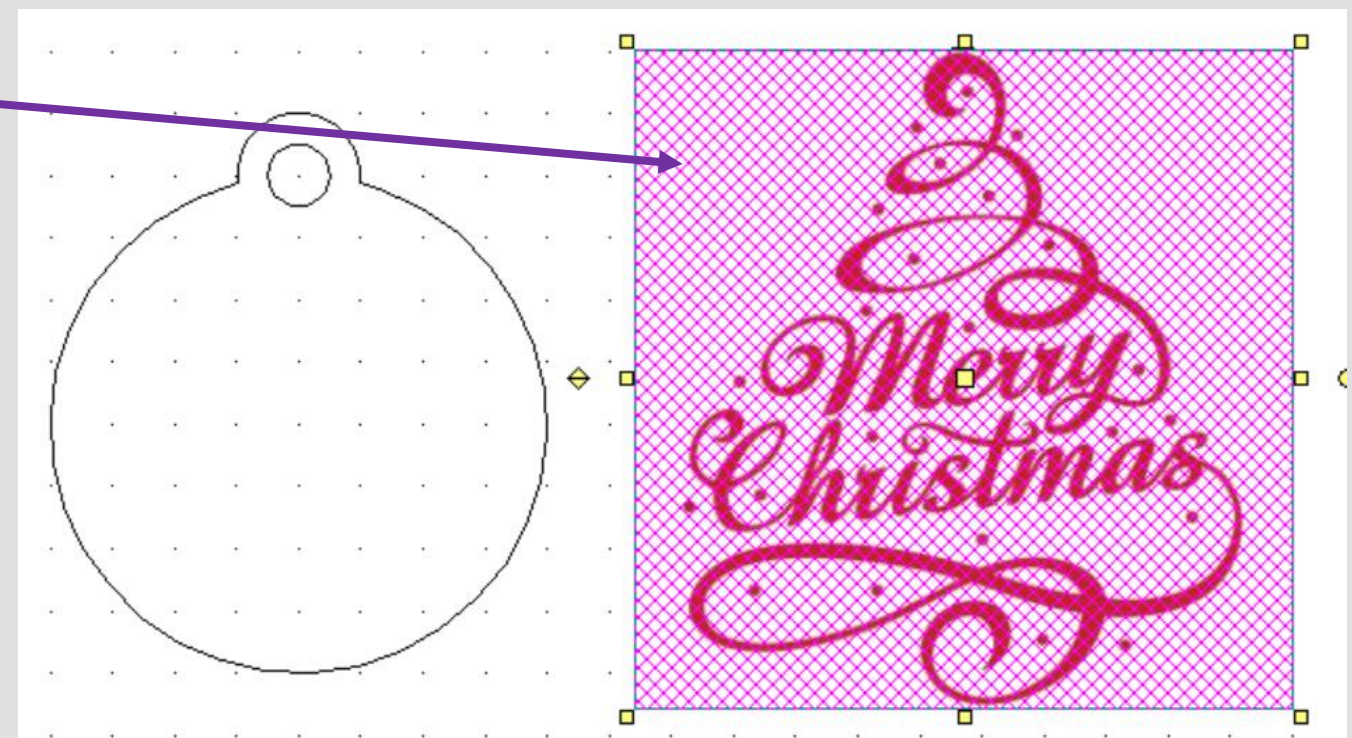


18. **Select** the image and a black outline should appear around the image as if its been *traced*.



19. Using the *select tool* click on the *actual image* not the *contoured traced lines*

Press the *delete* button to remove the image



Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

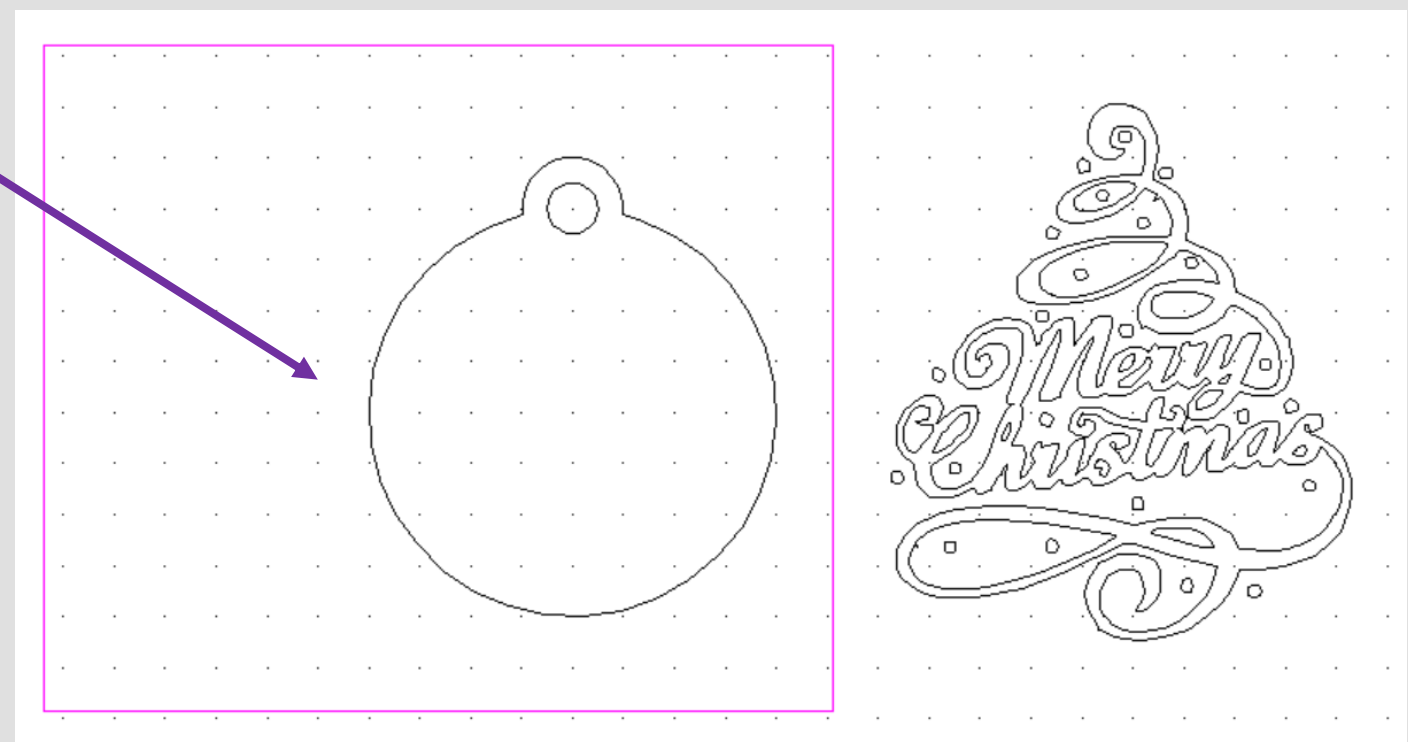
I can connect and apply my knowledge and skills to create ideas and products



20. You should be left with the **outline** of the original image.



21. Using the **select tool**, drag it over the bauble to **select all the parts**.

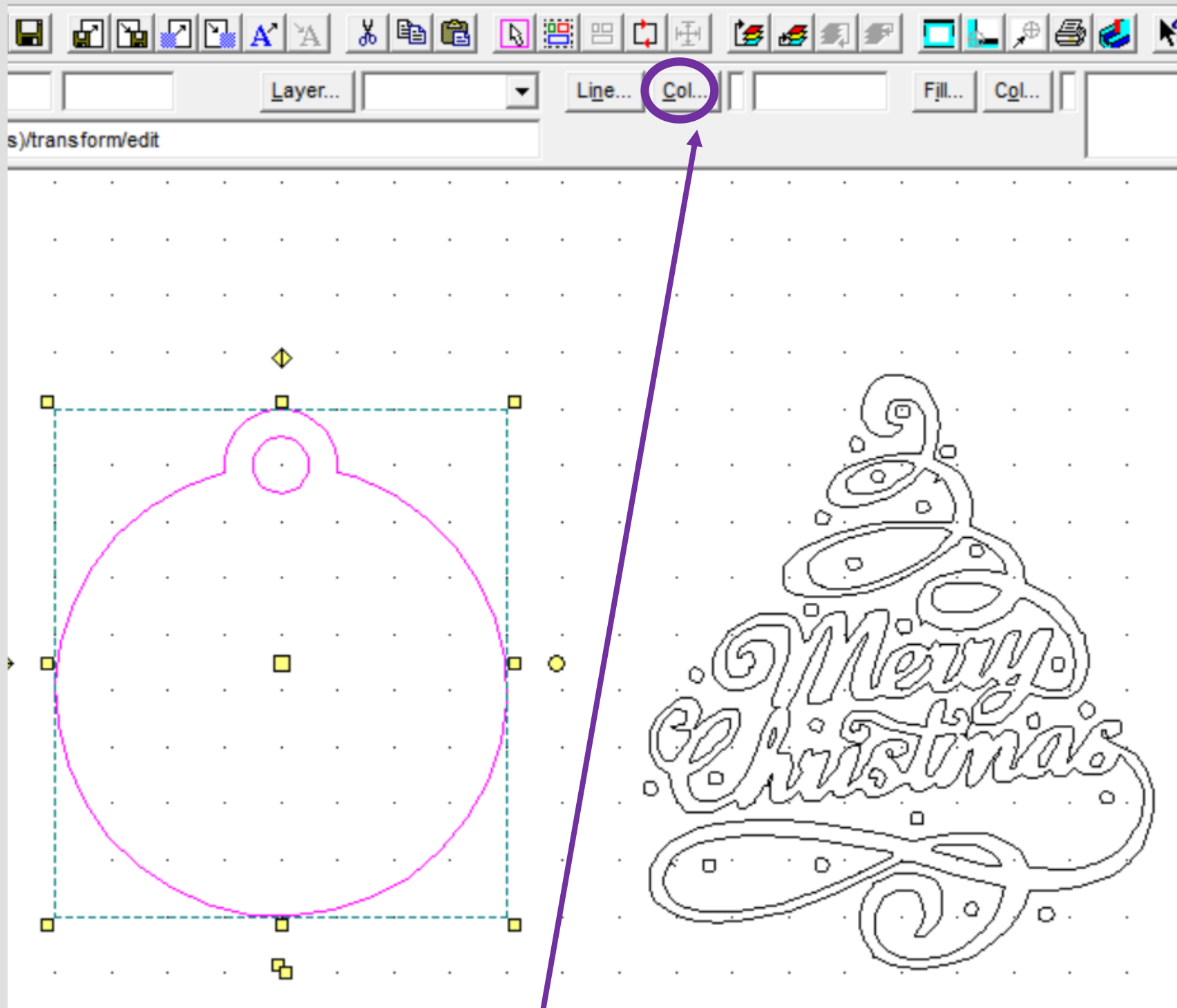


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



22. Using the *select tool*, click on the *line Col button* shown above.



Innovation



Digital



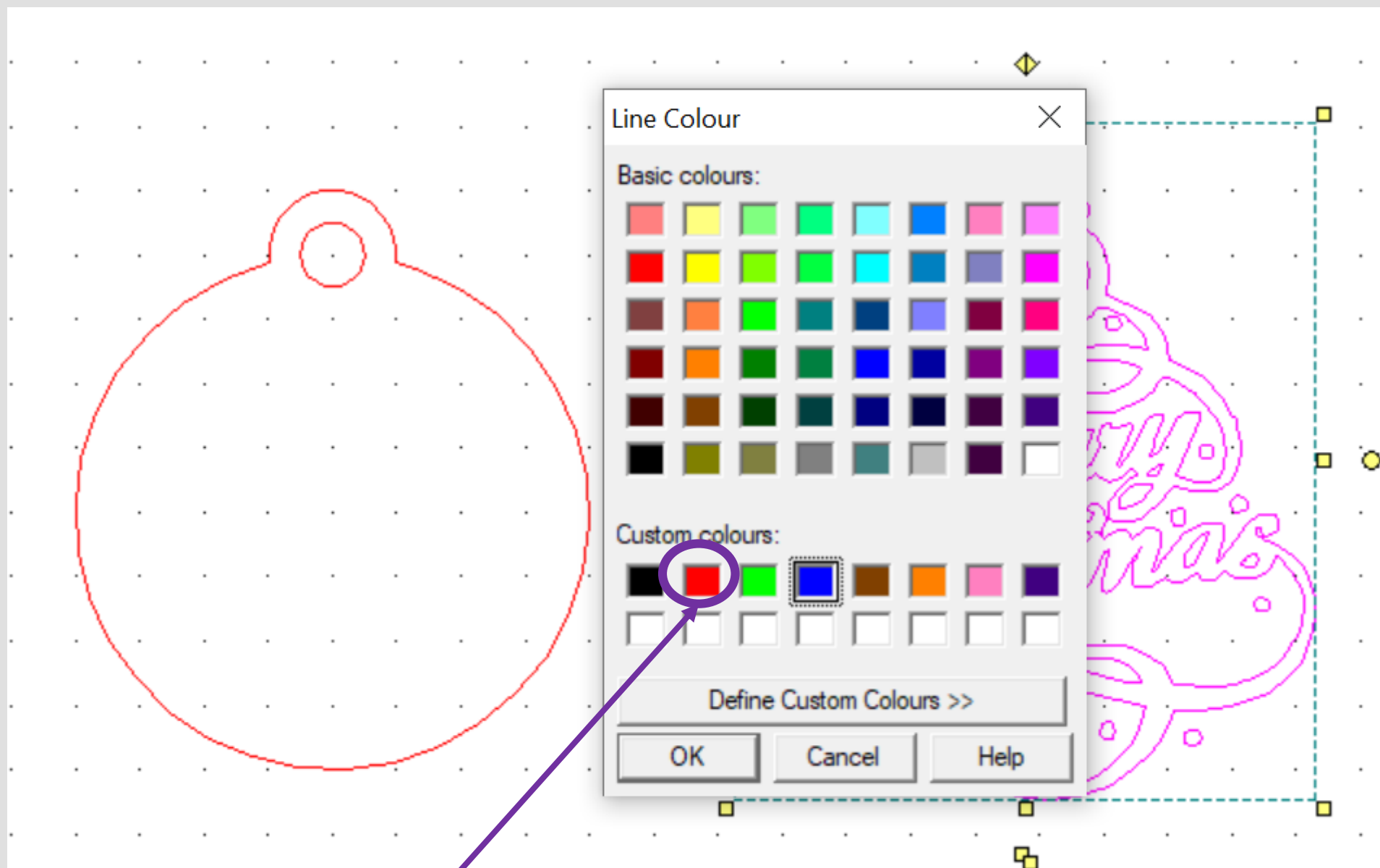
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



23. Select the **red colour** from *custom colours*. On the *laser cutter* red is a *cut line*. This will turn the outline of the bauble red ready to cut out.



Innovation



Digital



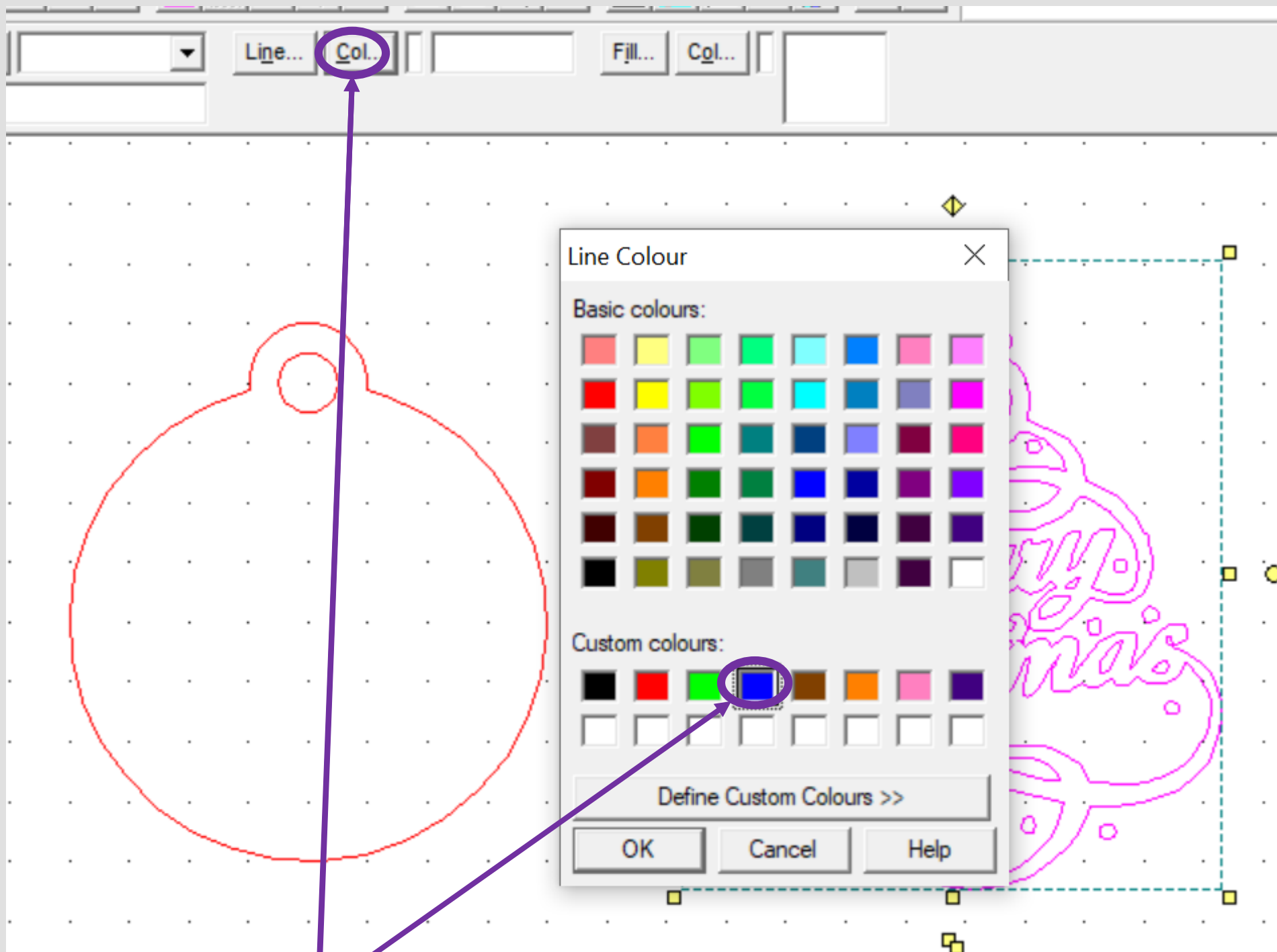
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



25. Using the *select tool*, drag it over the merry Christmas writing to **select all the parts**. Using the *select tool*, on the *line Col button* shown above. Select the **blue colour** from *custom colours*. On the *laser cutter blue* is a **engrave line**.



Innovation



Digital



Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

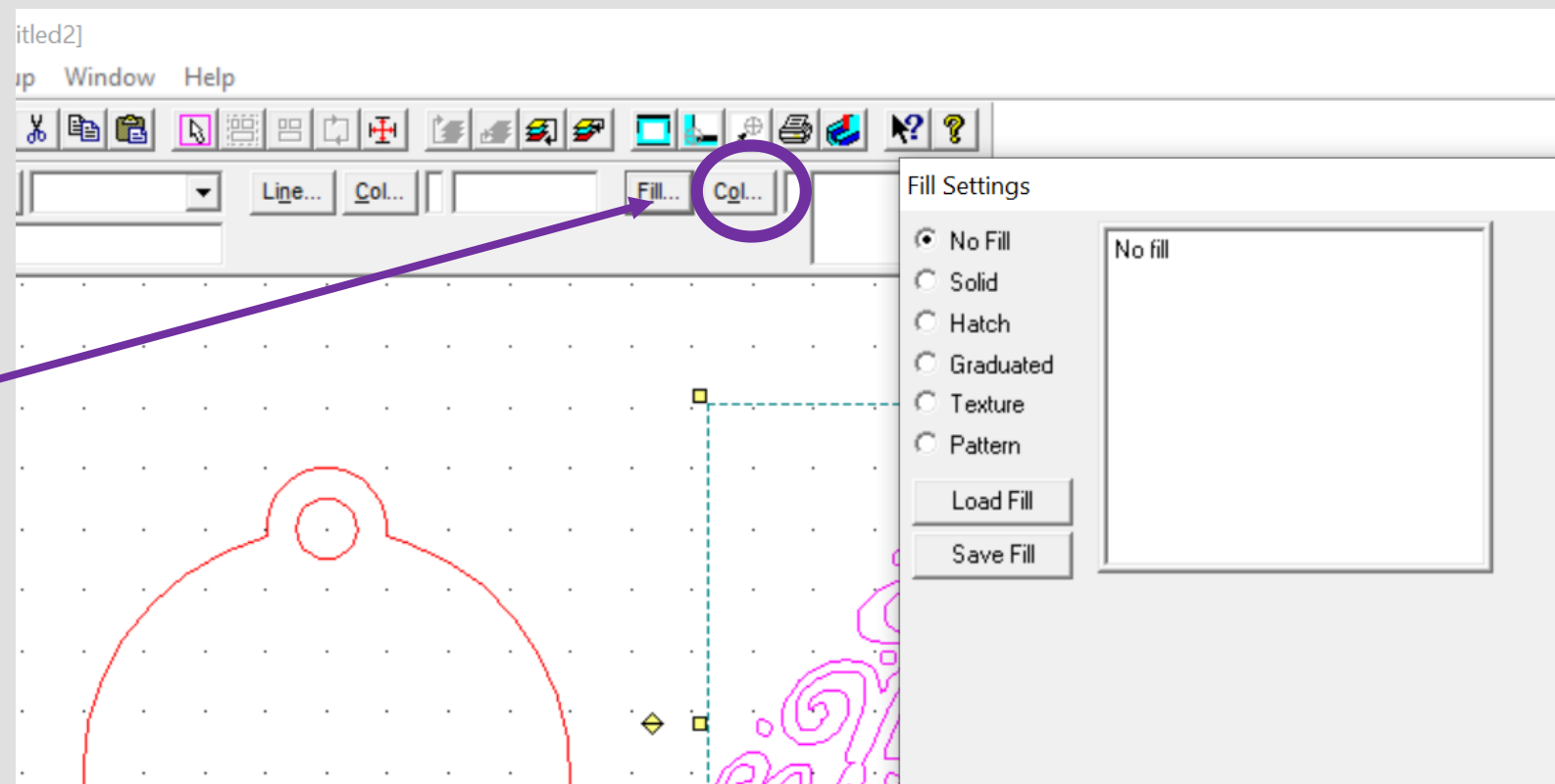
I can connect and apply my knowledge and skills to create ideas and products



26. The merry Christmas is now blue and this will be engraved.



27. Using the *select tool*, drag it over the merry Christmas writing to **select all the parts**. Using the *select tool*, on the *Fill Col* button shown opposite.




Innovation


Digital

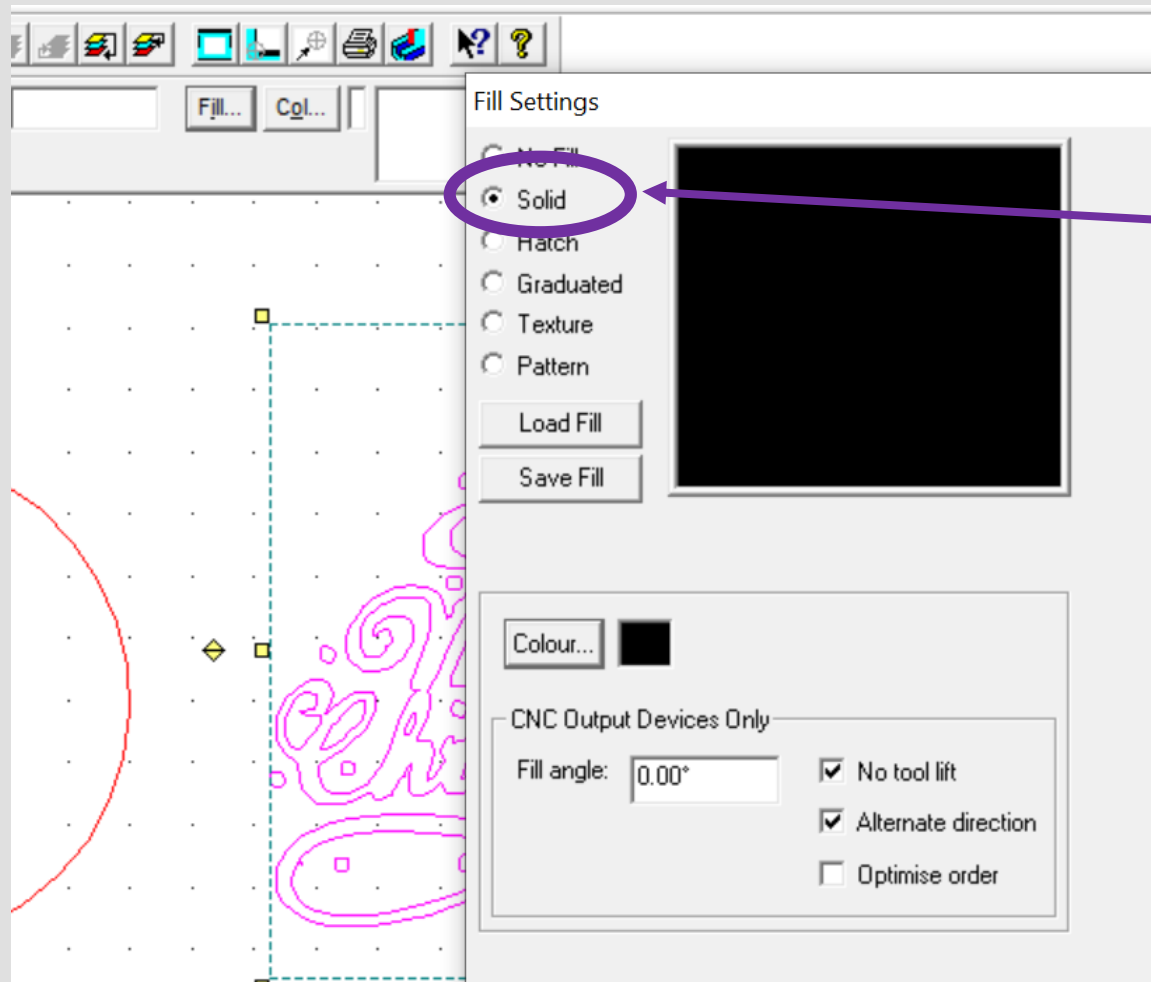

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

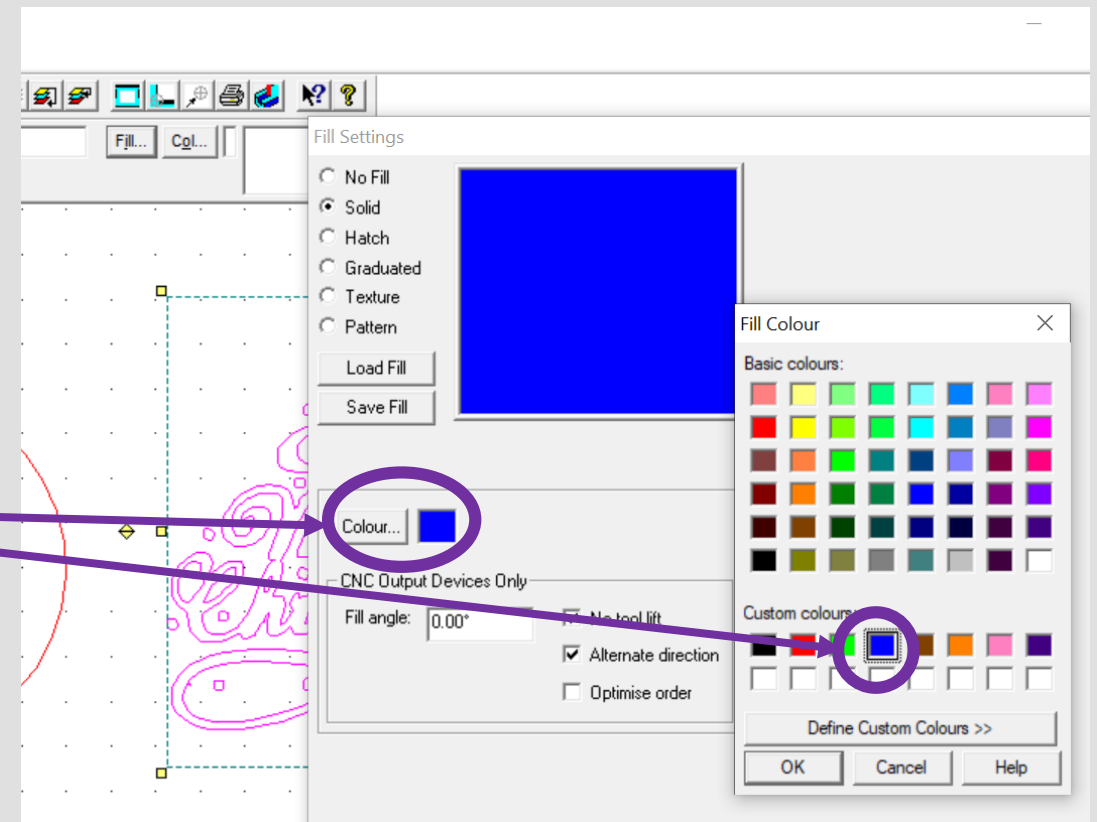
I can connect and apply my knowledge and skills to create ideas and products



28. Using the *select tool*, click on the *solid fill*.



29. Using the *select tool*, click on the *colour button*. Then select the colour *blue* from the custom colours




Innovation


Digital

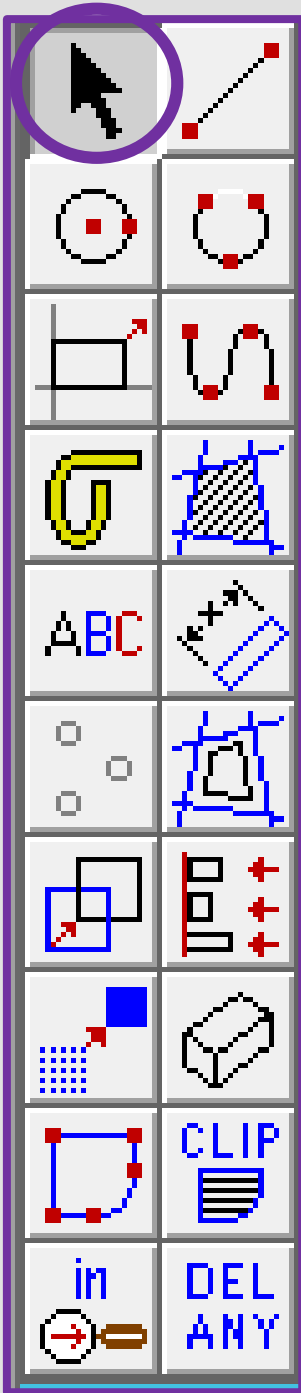

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



30. The design should now be **coloured in blue**. This will now be a more detailed engraved piece on the wood.



31. Using the **select tool**, click on the **Merry Christmas**. Then click the **middle square** to move it on to the bauble

32. Using the **select tool**, click on the corner squares to resize so it fits on the bauble

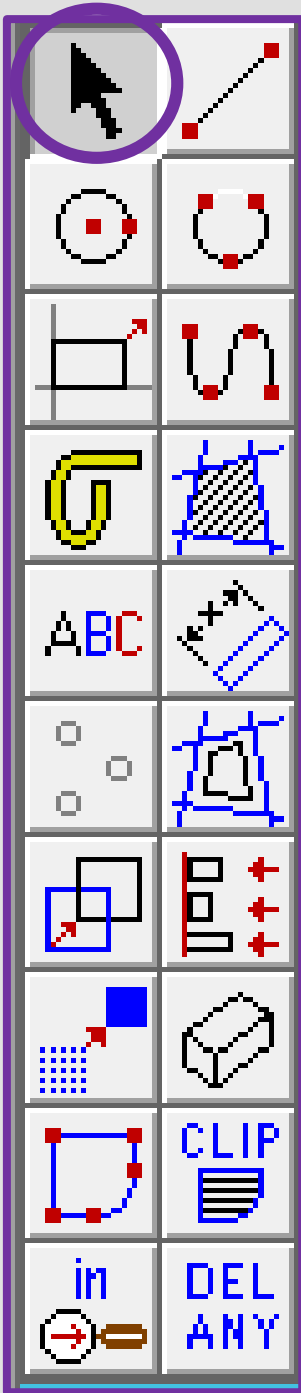


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

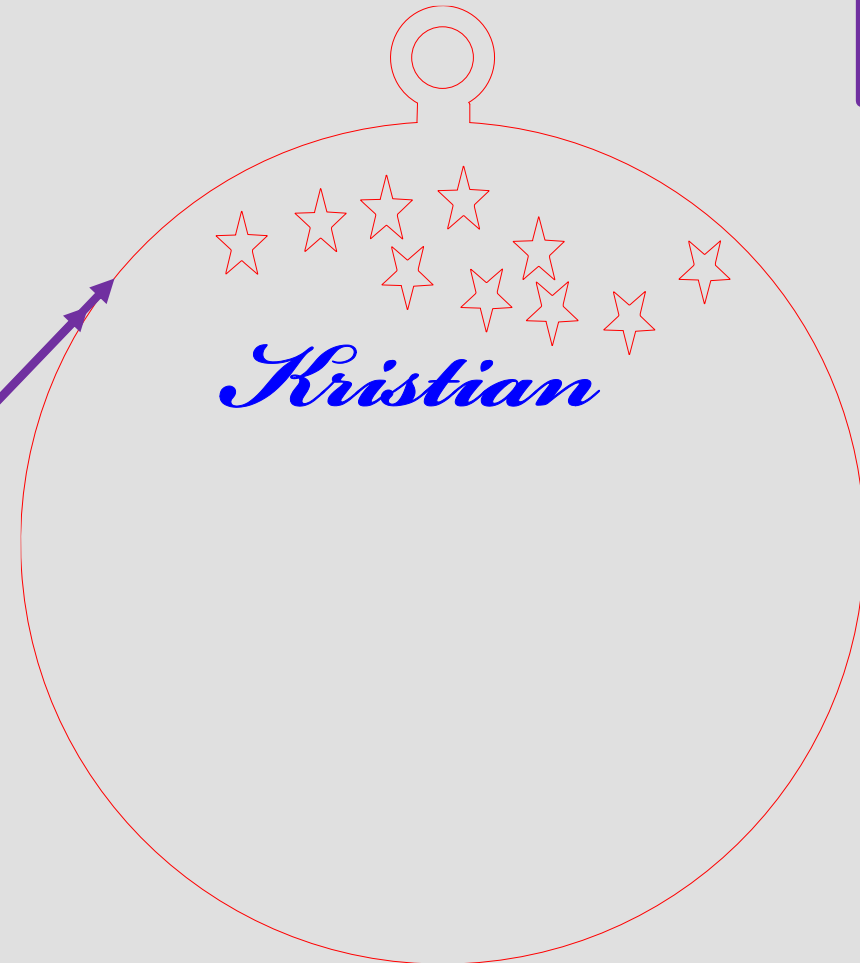
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



33. **Position** the Merry Christmas on the bauble as shown

34. **Design your own bauble** remember **red** cuts out and **blue** engraves




Innovation


Digital


Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

Learning Outcomes CAD Skills Checker

Learning Outcomes

- To develop advanced skills and problem solving skills when using 2D Design to draw and manufacture a 2D Christmas Bauble and a 3D Christmas Bauble to scale ready for laser cutting

By the end of this tutorial you will be able to...

- Import images
- Contour Bitmaps
- Draw a Christmas bauble using the correct size radius
- Using the skills you have learnt develop a 3D Christmas tree bauble
- Use the correct line colours to engrave and cut on a laser cutter

New Skills	Advanced Skills
Zoom tool <input type="checkbox"/>	Rotate tool <input type="checkbox"/>
Move tool <input type="checkbox"/>	Contour Bitmap tool <input type="checkbox"/>
Radius tool <input type="checkbox"/>	Vectorise Bitmap tool <input type="checkbox"/>
Line tool <input type="checkbox"/>	Text tool <input type="checkbox"/>
Rectangle tool <input type="checkbox"/>	Arc tool <input type="checkbox"/>
Circle tool <input type="checkbox"/>	Attach tool <input type="checkbox"/>
Eraser tool <input type="checkbox"/>	Contour tool <input type="checkbox"/>
Delete Part tool <input type="checkbox"/>	Line colour tool <input type="checkbox"/>



Innovation



Digital



Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

- connect and apply their knowledge and skills to create ideas and products



2. Laser Cut Christmas Tree Bauble



Innovation



Digital



Problem
Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

CAD Skills Checker

Learning Outcomes

- To develop advanced skills and problem solving skills when using 2D Design to draw and manufacture a 2D Christmas Bauble and a 3D Christmas Bauble to scale ready for laser cutting

By the end of this tutorial you will be able to...

- Import images
- Contour Bitmaps
- Draw a Christmas bauble using the correct size radius
- Using the skills you have learnt develop a 3D Christmas tree bauble
- Use the correct line colours to engrave and cut on a laser cutter

New Skills	Advanced Skills
Zoom tool <input type="checkbox"/>	Rotate tool <input type="checkbox"/>
Move tool <input type="checkbox"/>	Contour Bitmap tool <input type="checkbox"/>
Radius tool <input type="checkbox"/>	Vectorise Bitmap tool <input type="checkbox"/>
Line tool <input type="checkbox"/>	Text tool <input type="checkbox"/>
Rectangle tool <input type="checkbox"/>	Arc tool <input type="checkbox"/>
Circle tool <input type="checkbox"/>	Attach tool <input type="checkbox"/>
Eraser tool <input type="checkbox"/>	Contour tool <input type="checkbox"/>
Delete Part tool <input type="checkbox"/>	Line colour tool <input type="checkbox"/>



Innovation



Digital



Problem Solving

Progression Step

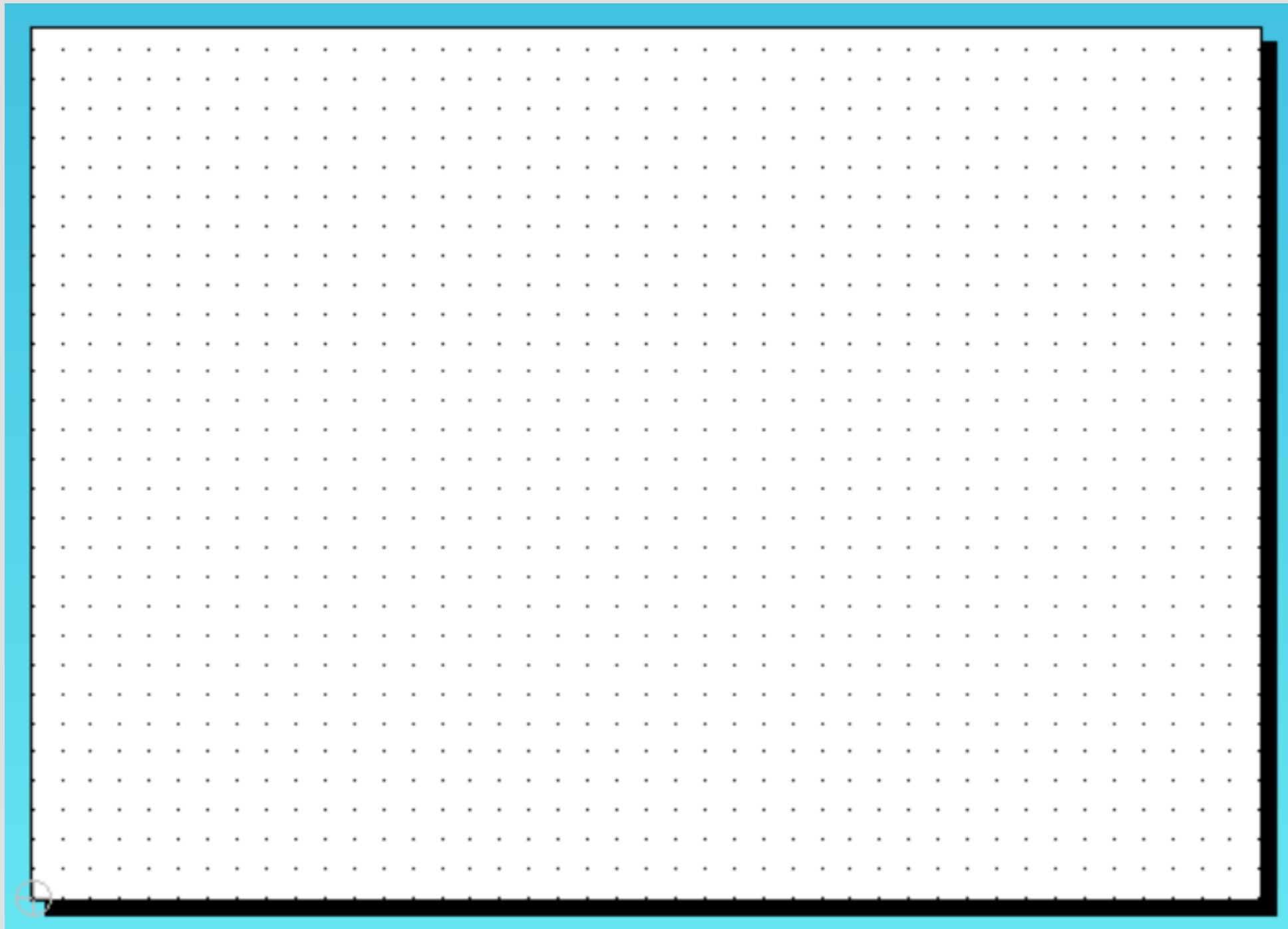
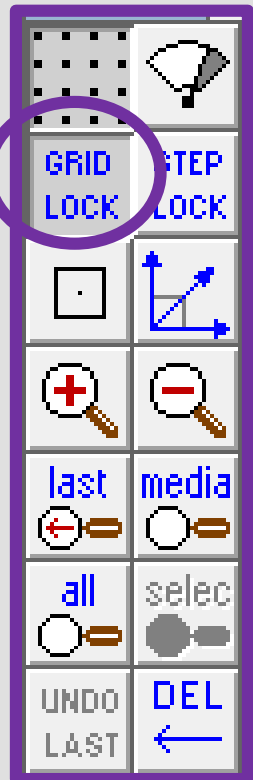
I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

- connect and apply their knowledge and skills to create ideas and products



1. Click the *grid lock tool* shown on




Innovation


Digital

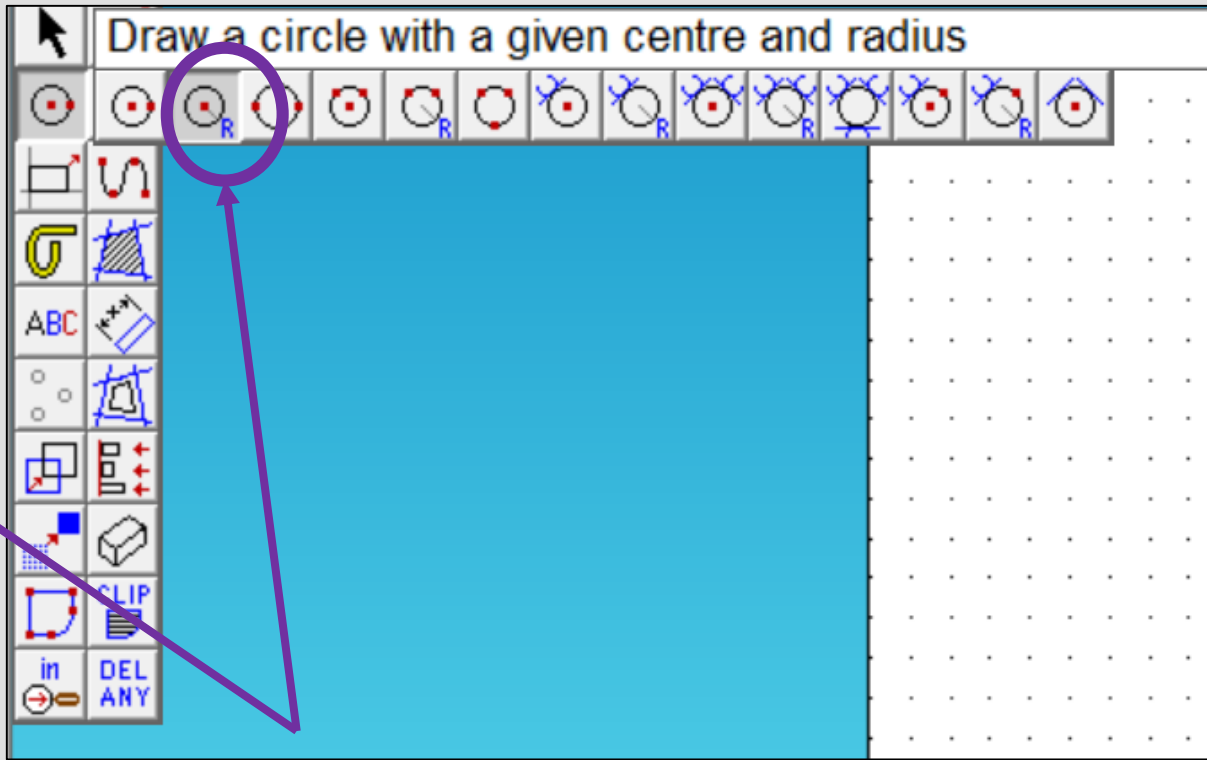
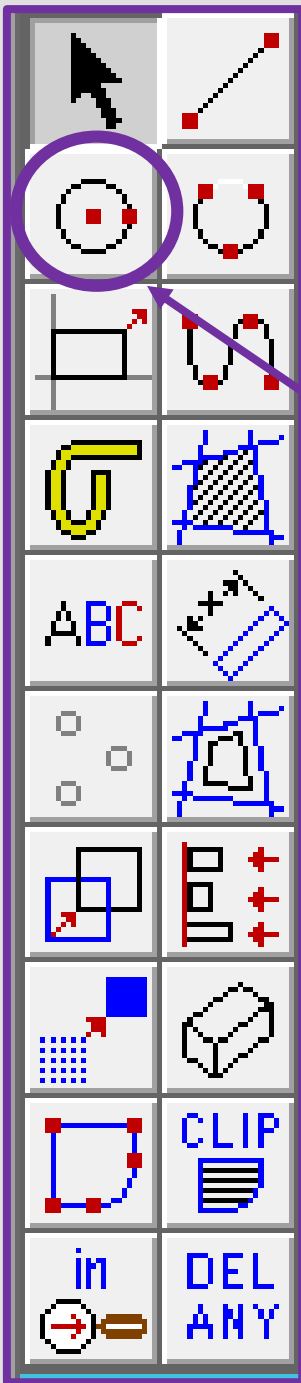

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

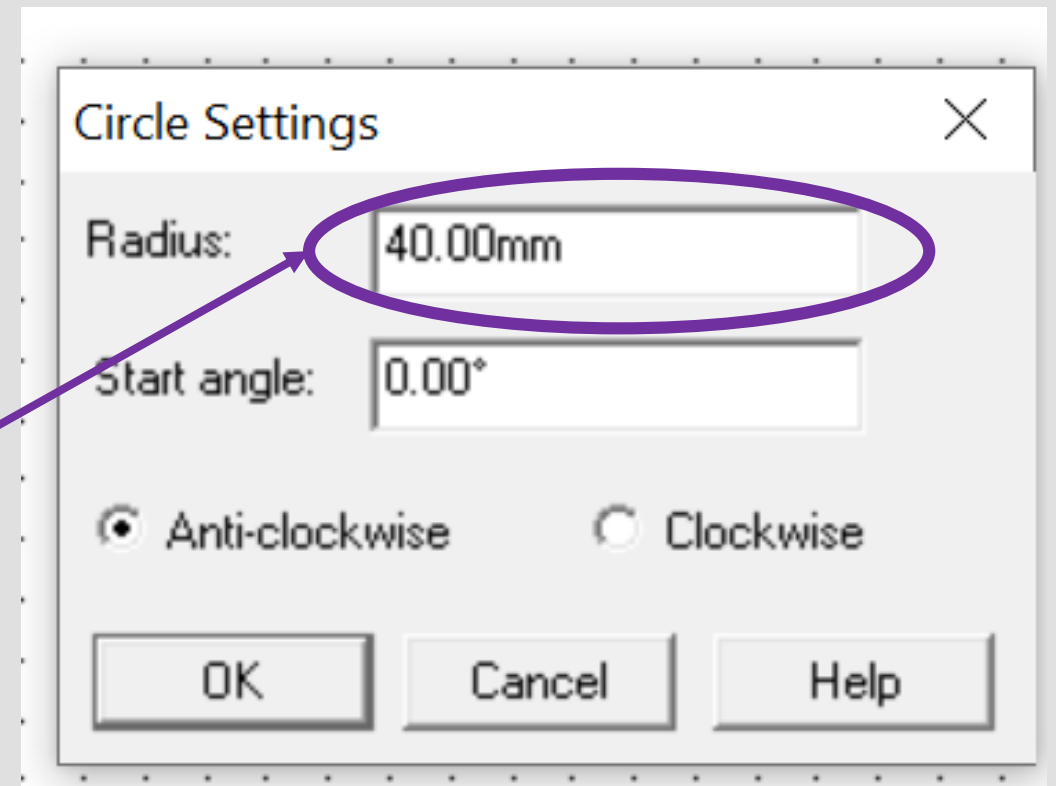
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



2. **Click** and hold on the *circle tool* until it extends out as shown above. Click on the second one in a circle with a **given centre and radius**

3. In the **circle settings** box type in **40.00** in the radius box and **press enter**



Innovation



Digital



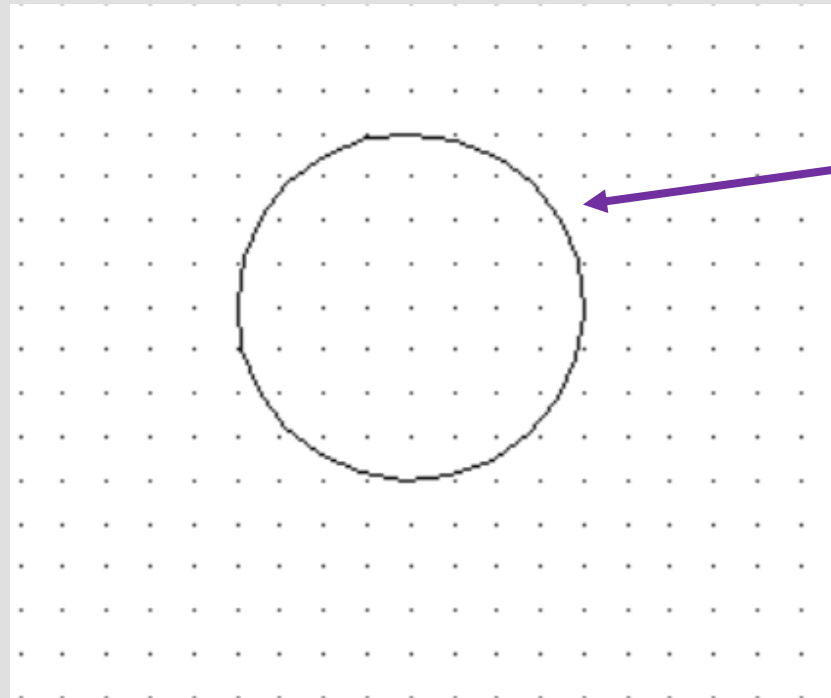
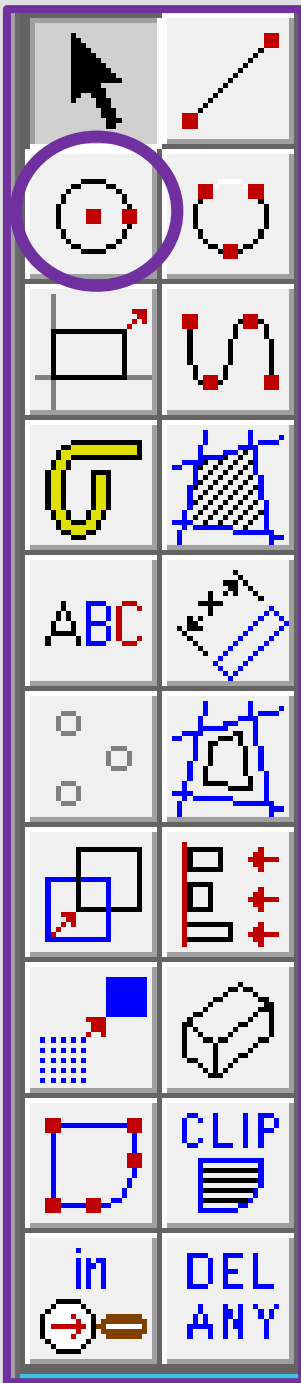
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

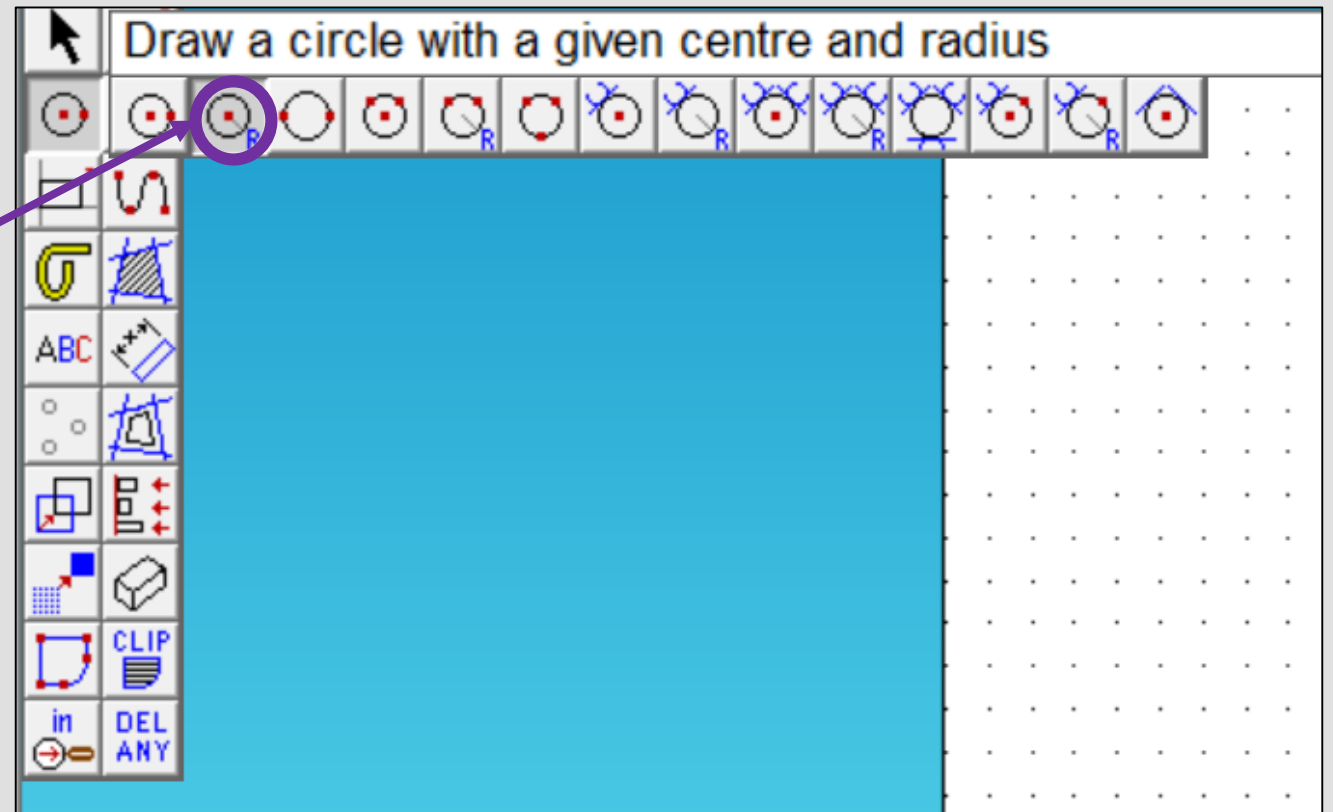
I can connect and apply my knowledge and skills to create ideas and products



4. Position the circle on the page.



5. Click and the circle with a **given centre and radius**. It should be selected from last time.

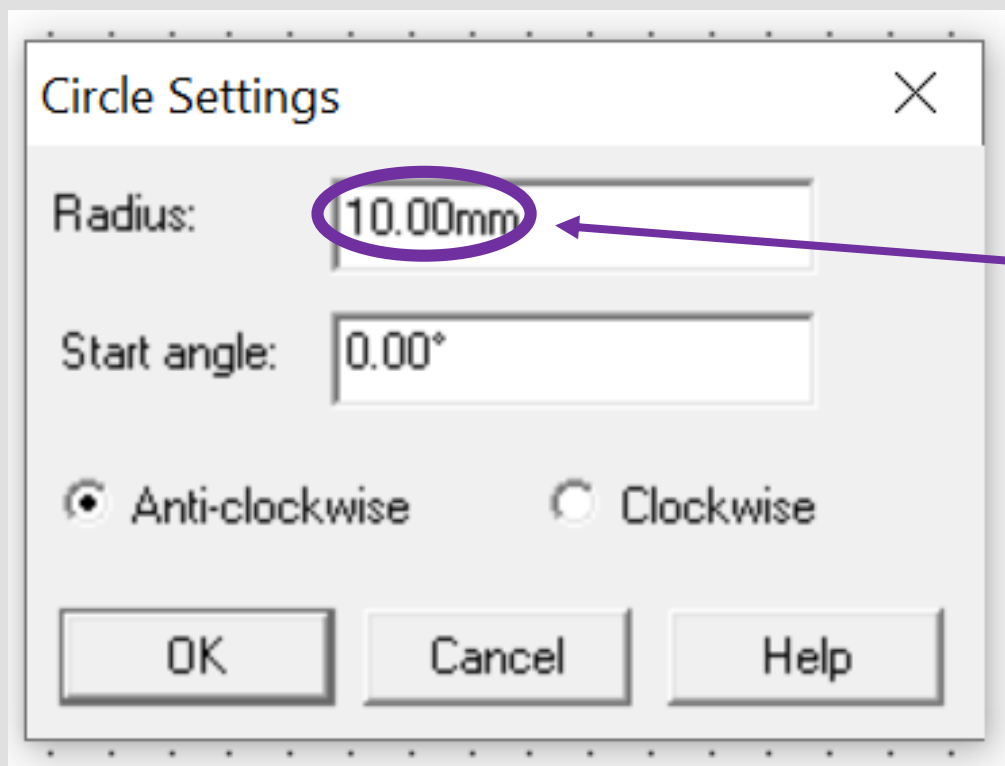
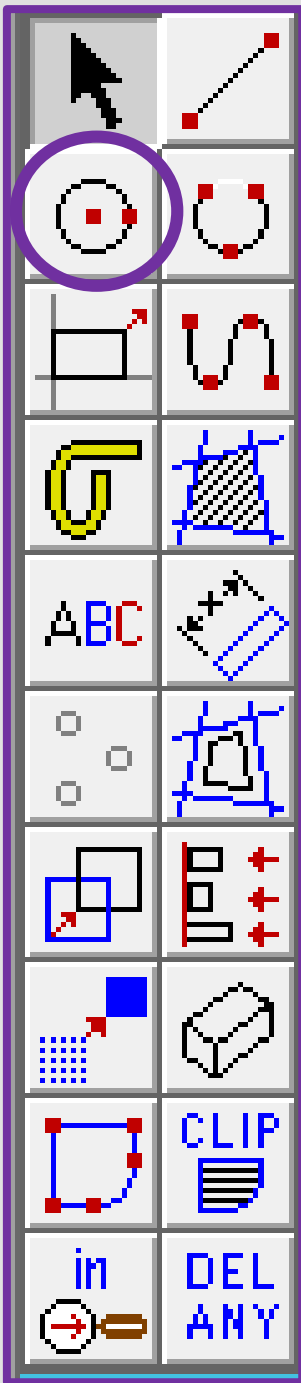


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

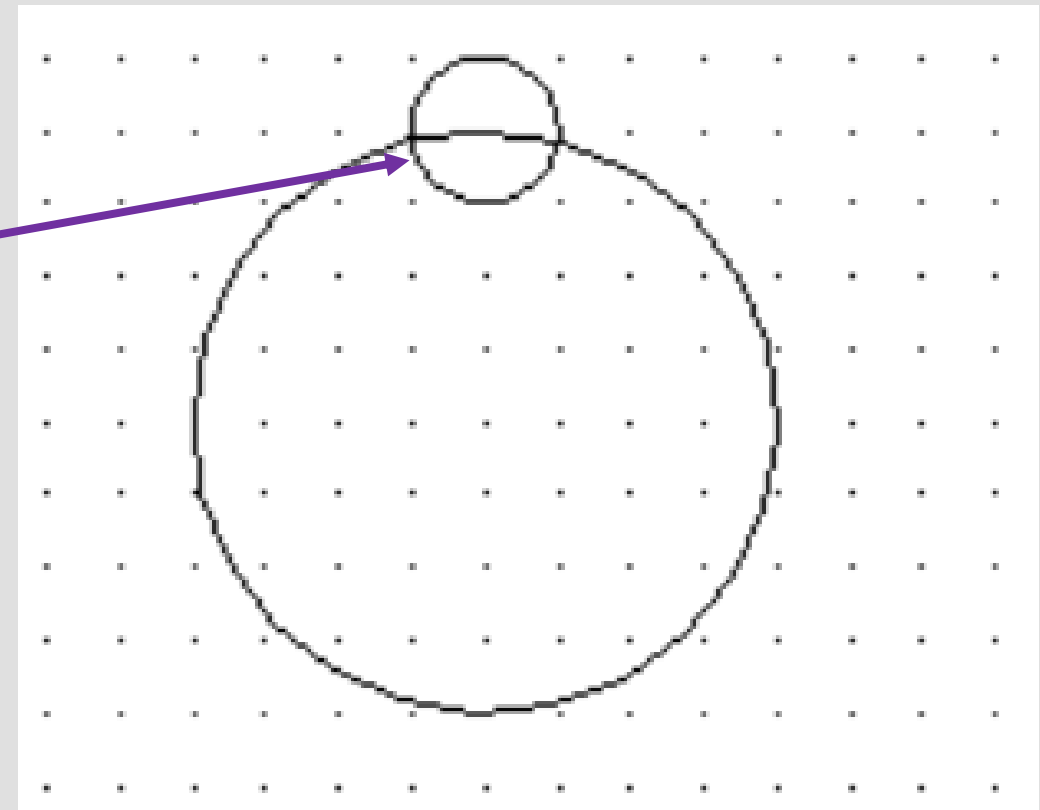
I can connect and apply my knowledge and skills to create ideas and products



6. In the **circle settings** box type in **10.00** in the radius box and **press enter**



7. **Position** the **circle** shown over the first circle shown opposite

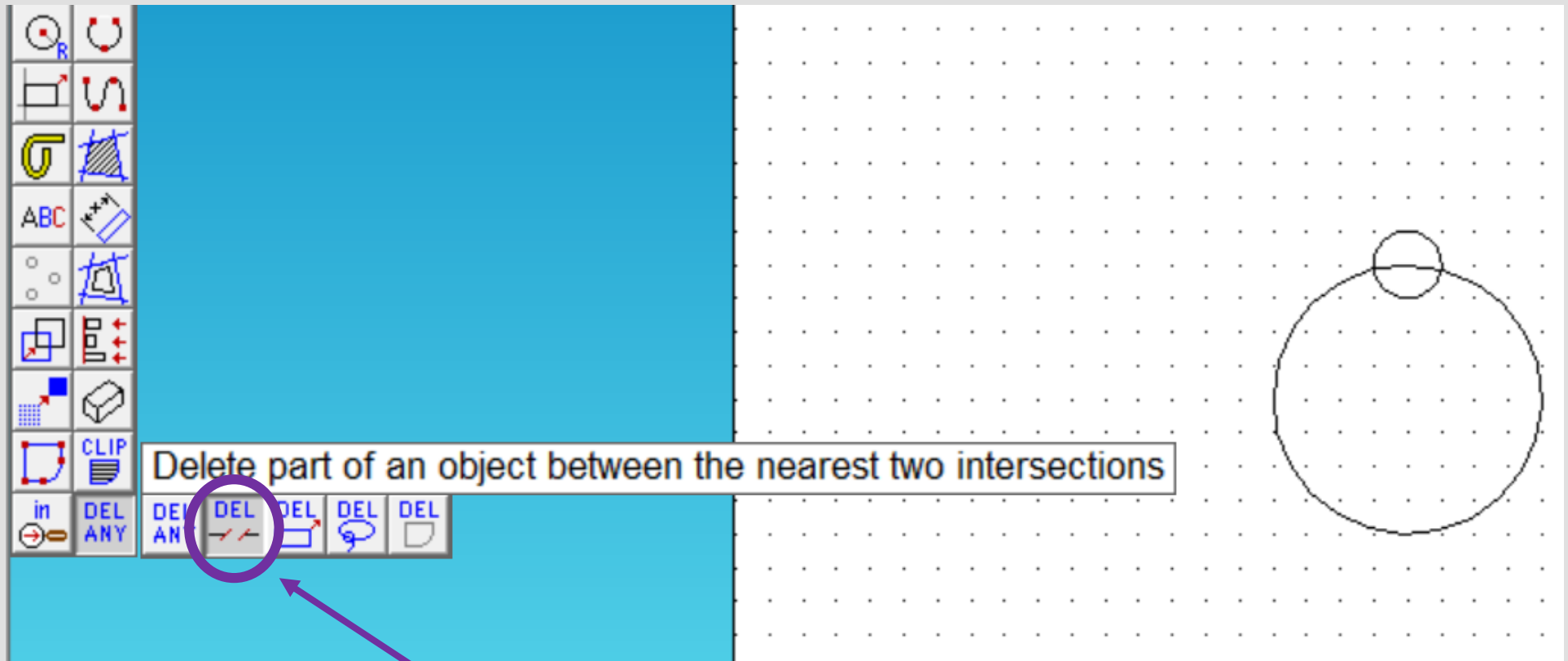
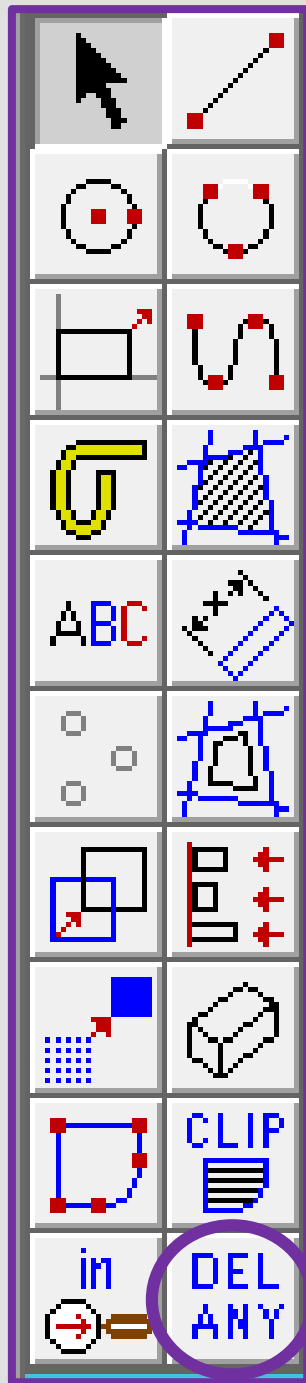


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

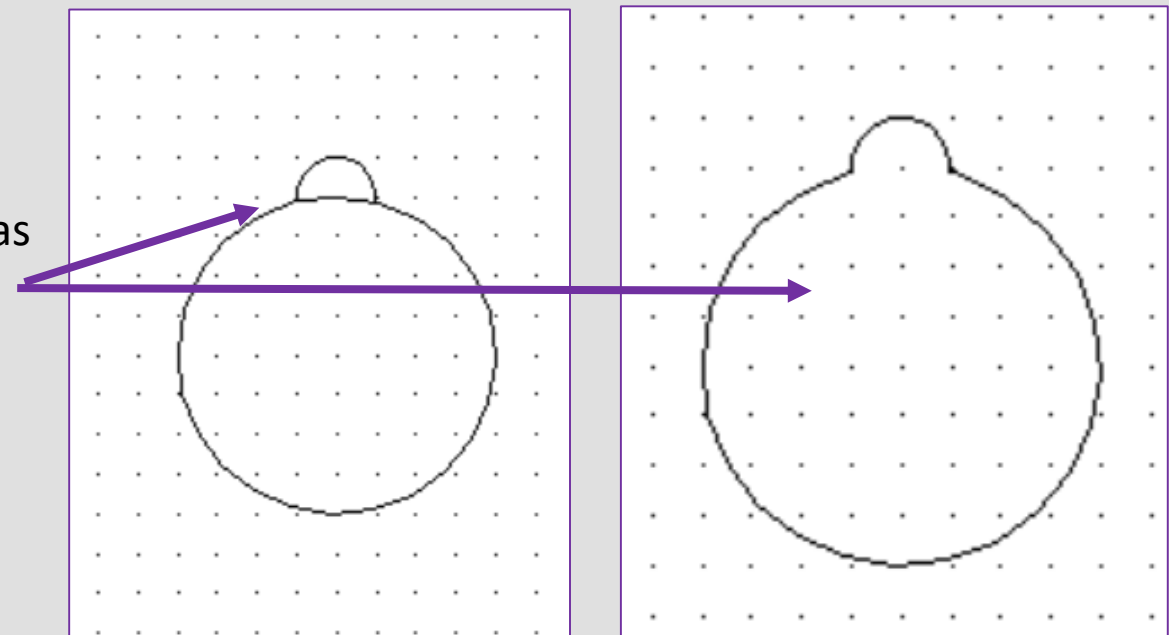
Learning Outcome

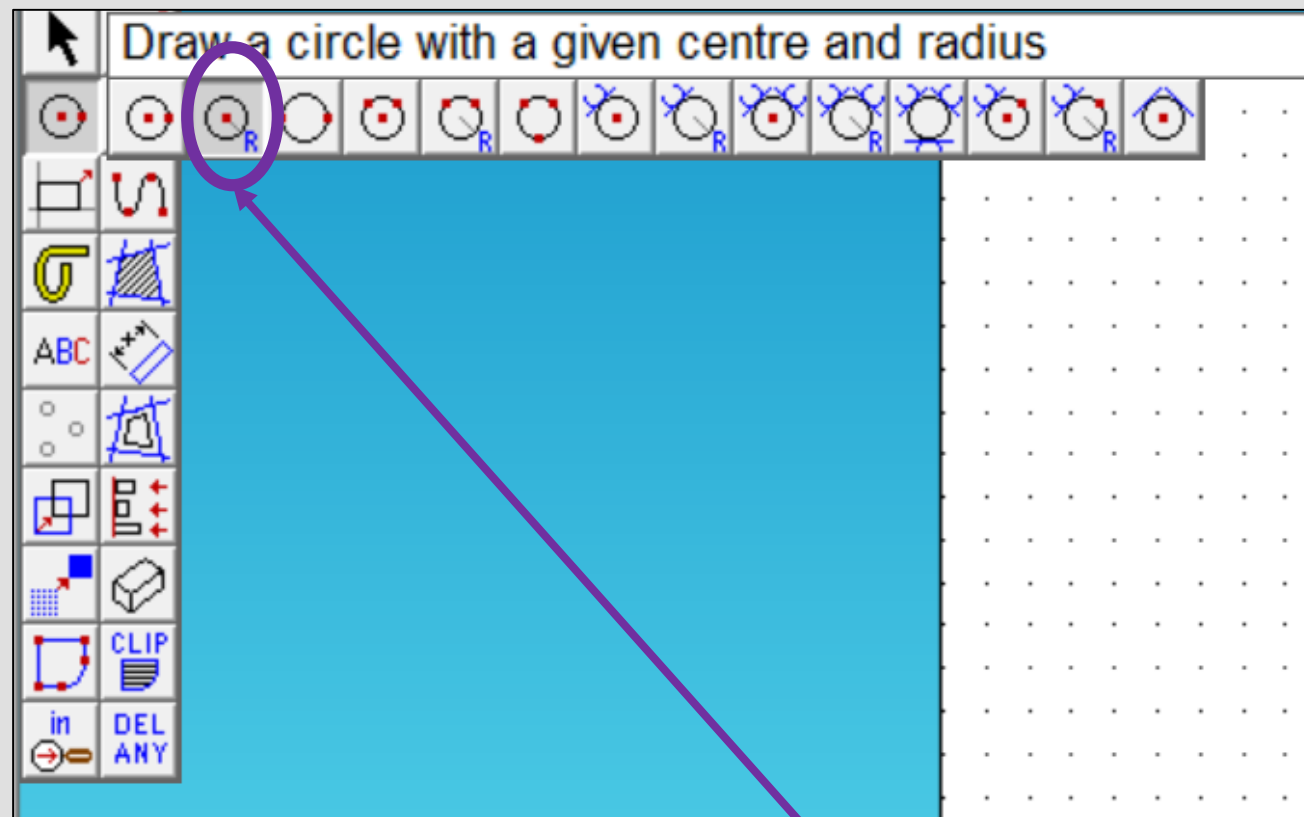
I can connect and apply my knowledge and skills to create ideas and products



8. Click and **hold** the **DEL ANY** toolbar down so it **extends** as shown. Click on **DEL PART**.

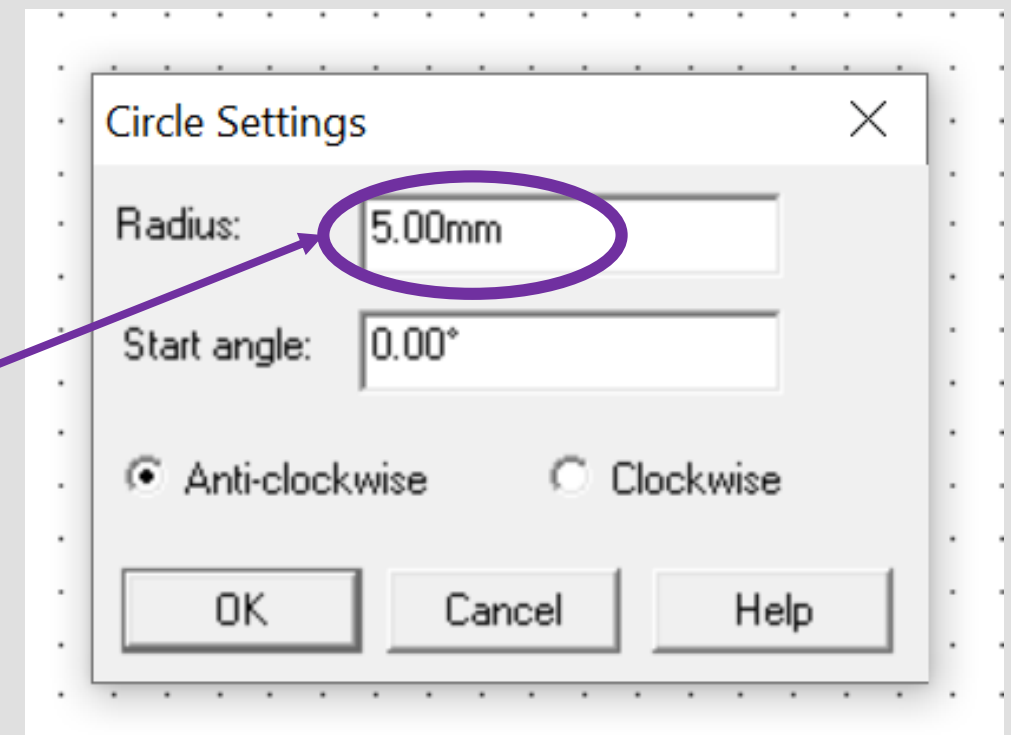
9. Using the **DEL PART** tool delete the intersecting lines to make one Christmas tree bauble shape as shown opposite





10. **Click** and the circle with a *given centre and radius*. It should be selected from last time.

11. In the **circle settings** box type in **5.00** in the radius box and **press enter**

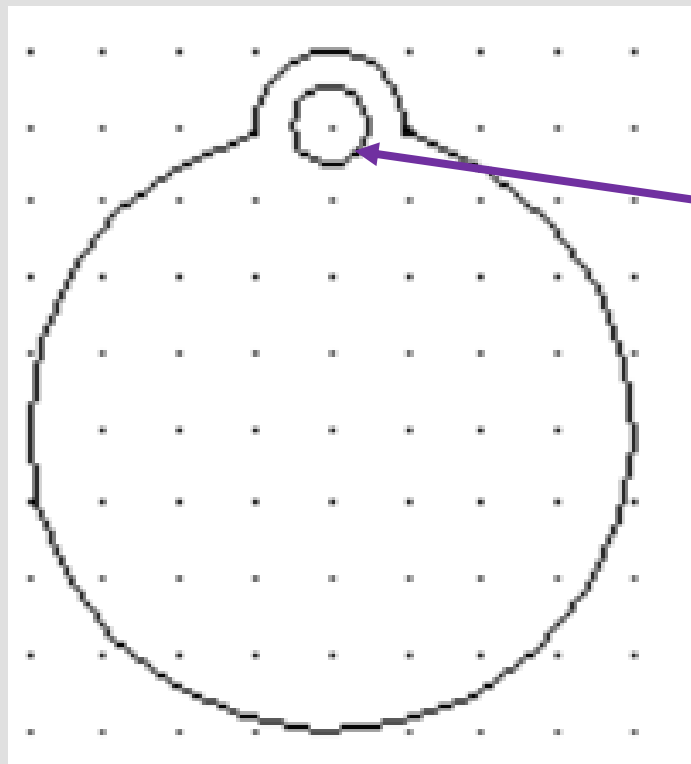
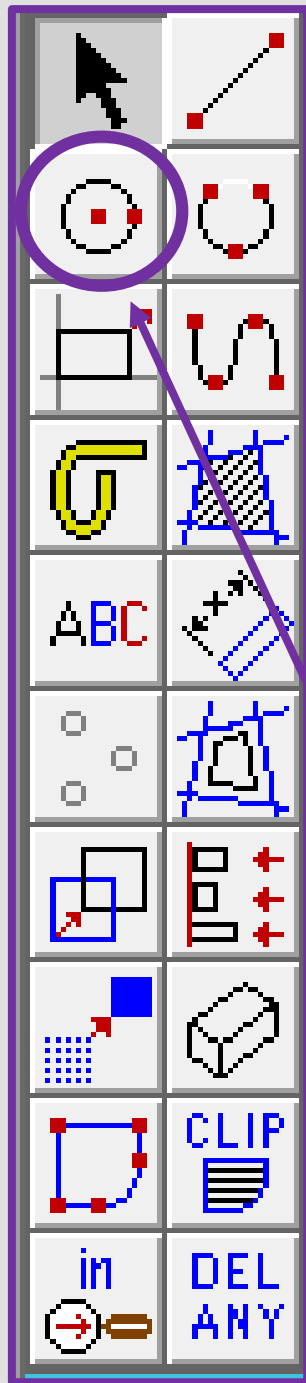


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

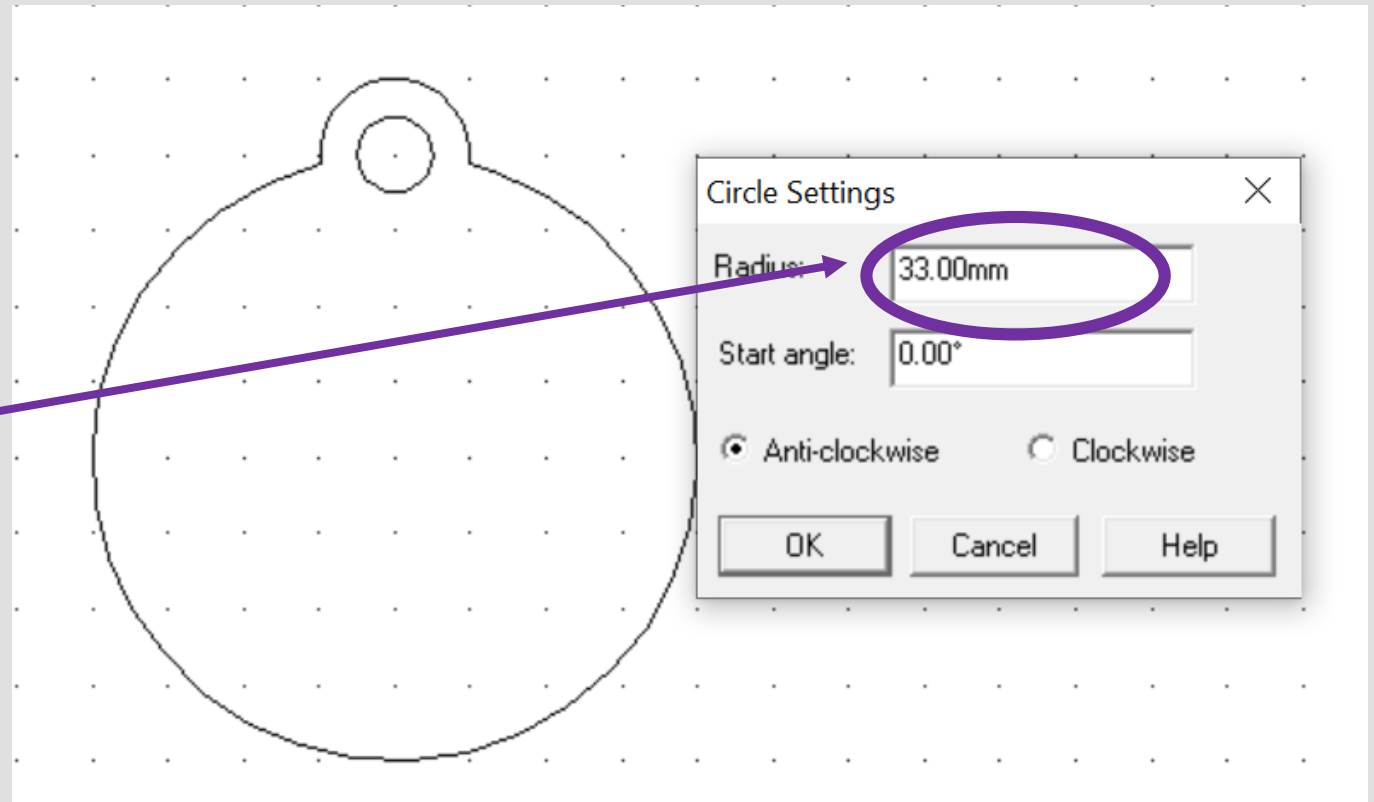


12. **Position** the **circle** shown in the circle shown opposite. This is the hole to attach string or push the branch of your Christmas tree through



13. **Click** and the circle with a **given centre and radius**. It should be selected from last time.

14. In the **circle settings** box type in **33.00** in the radius box and **press enter**

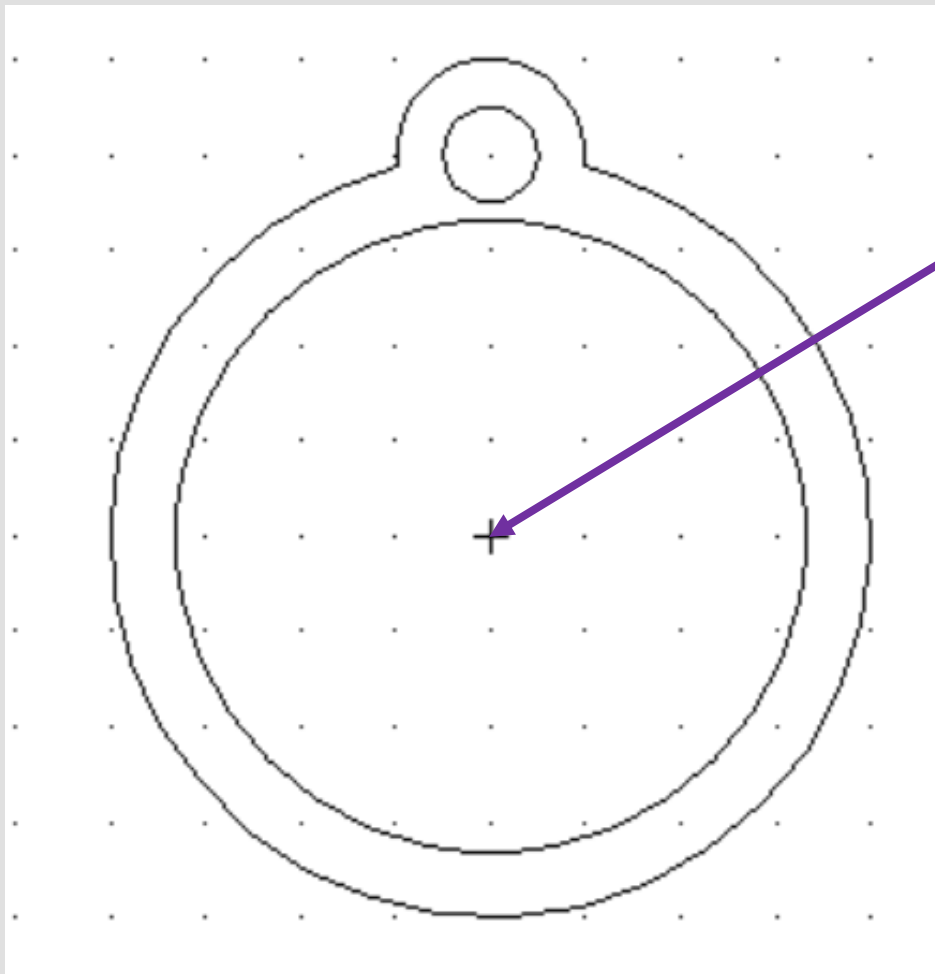


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

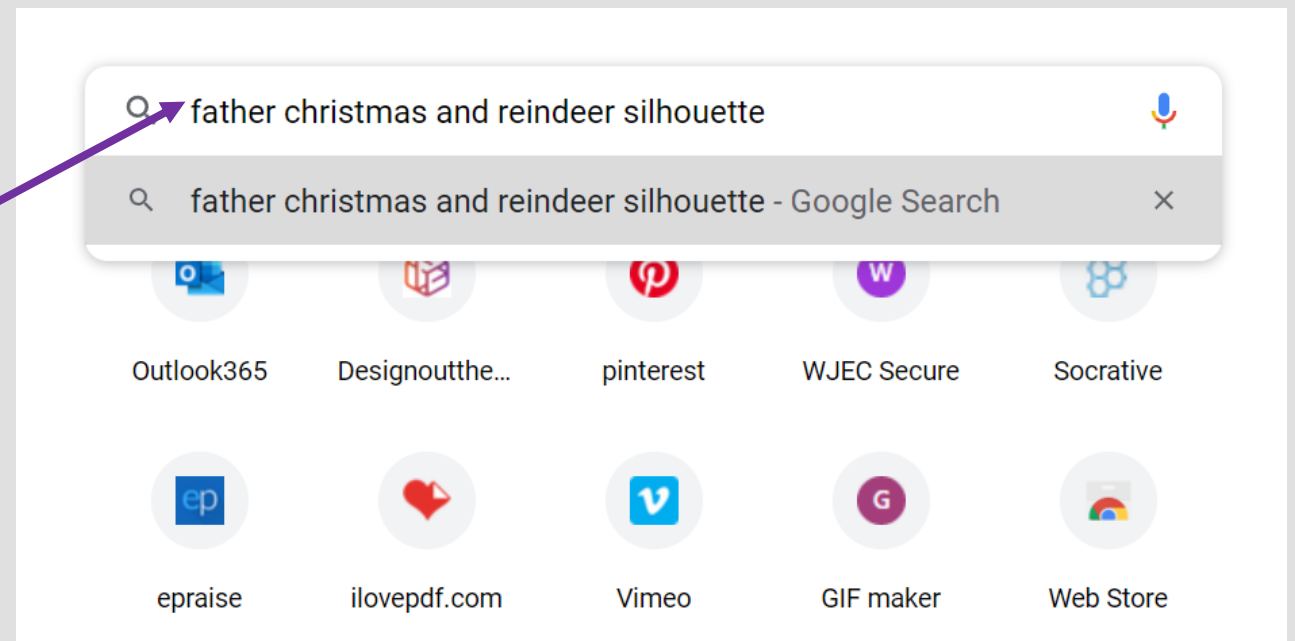
I can connect and apply my knowledge and skills to create ideas and products



14. **Position** the **circle** shown in the circle in the middle of the bauble as shown opposite.



15. Using google chrome search for a *father Christmas and reindeer silhouette*.




Innovation


Digital

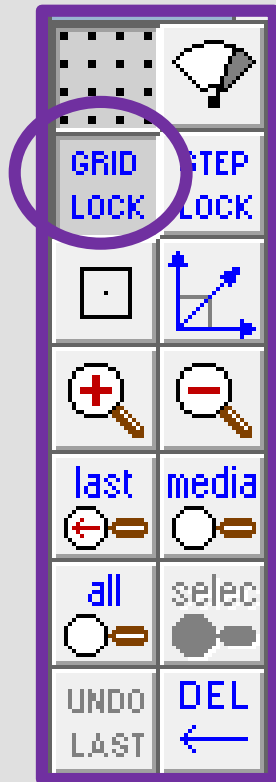
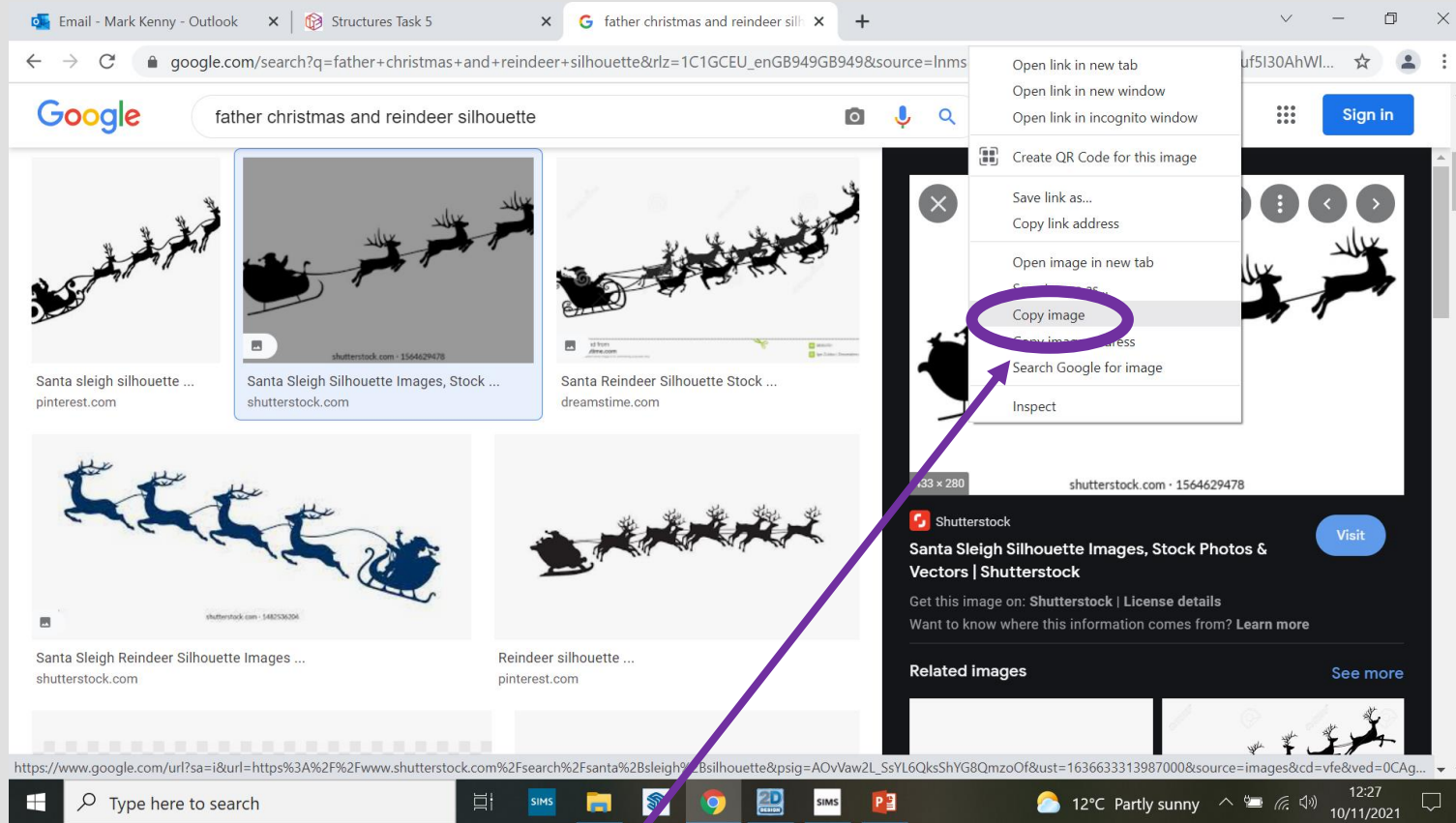

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

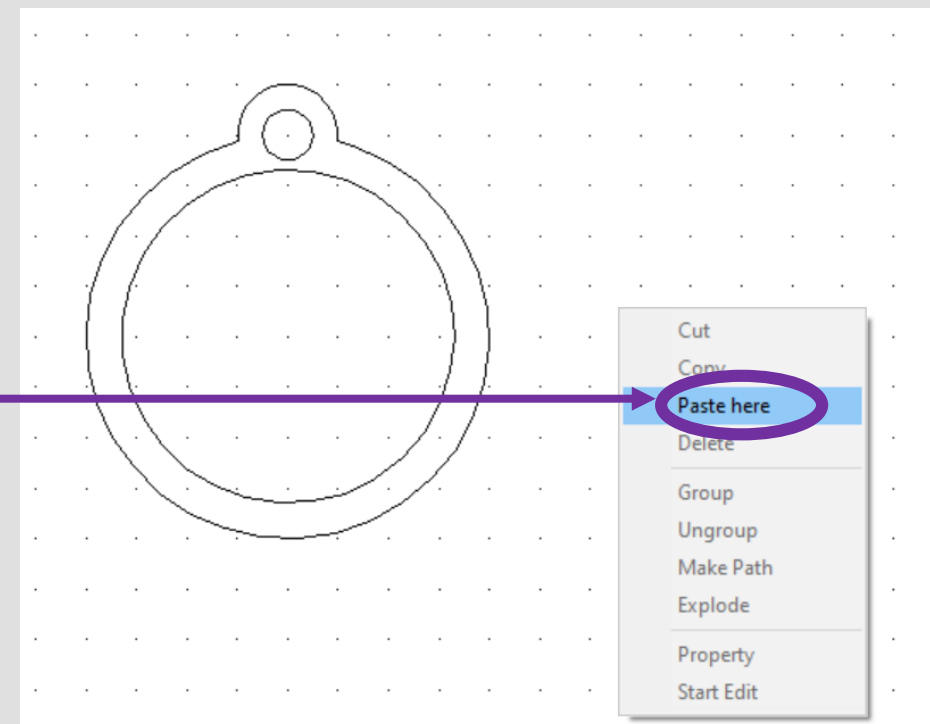
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



16. Once you have found a image you like. **Right click** and **Copy image**

17. In **2D design** **right click** and **select paste here**.




Innovation


Digital

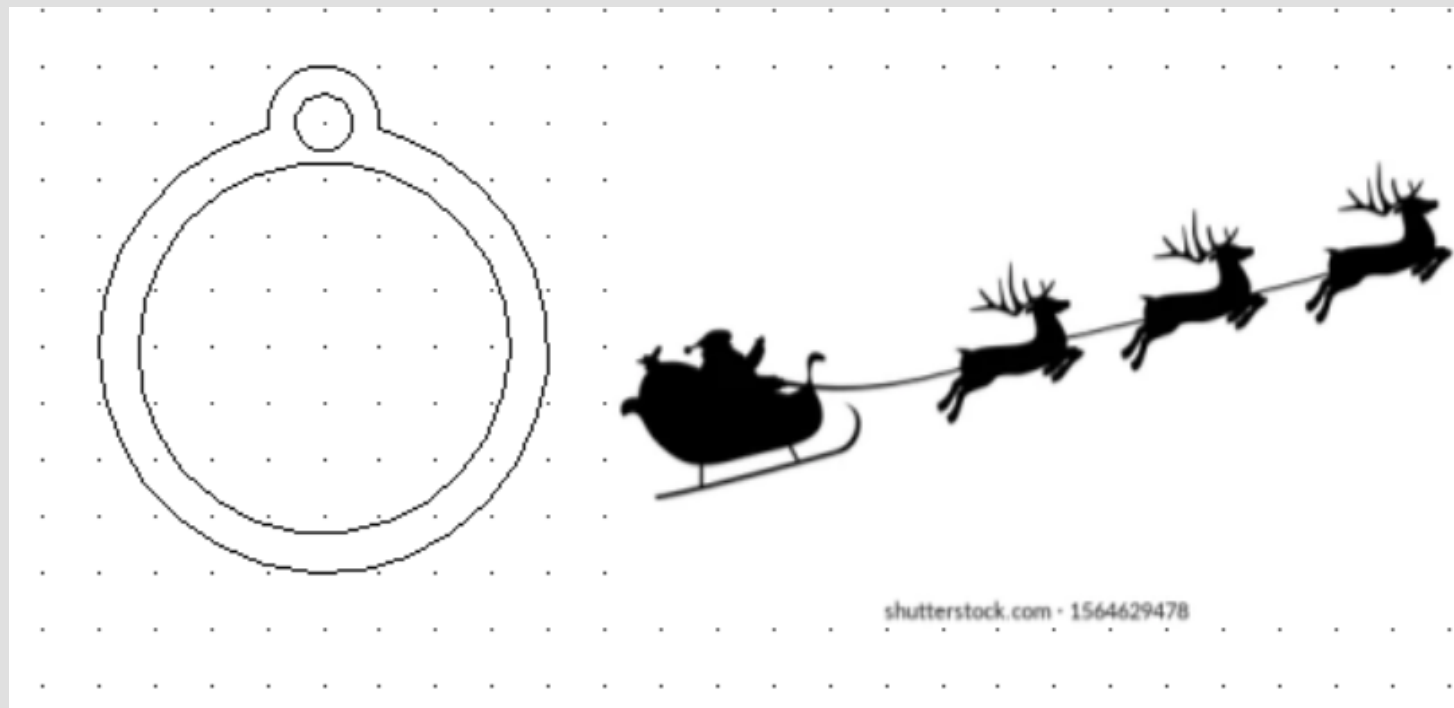

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

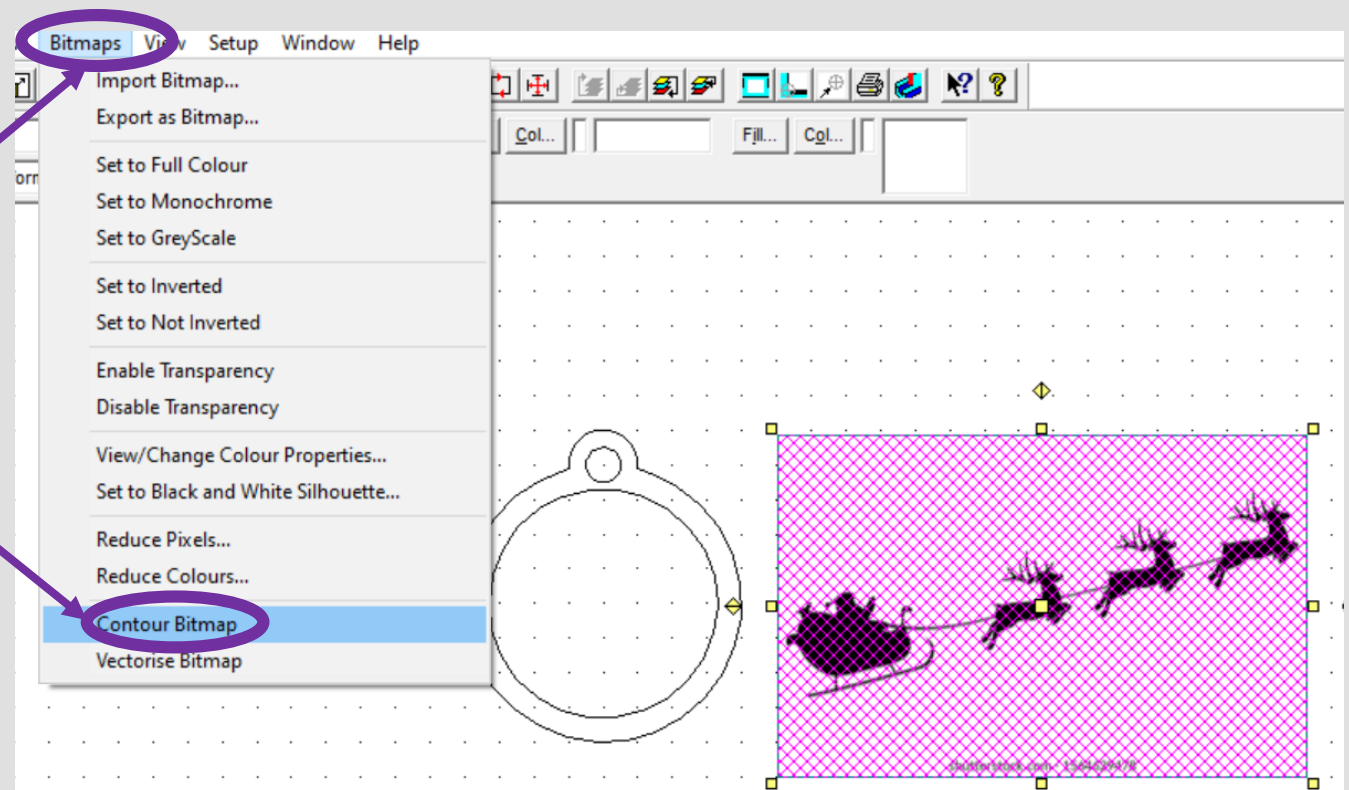
I can connect and apply my knowledge and skills to create ideas and products



18. Your image should copy straight into 2D design as shown opposite.



19. Select the image and then the **bitmaps toolbar** shown on the top toolbar and in the circle shown opposite. Go down to **contour bitmap**



Innovation



Digital



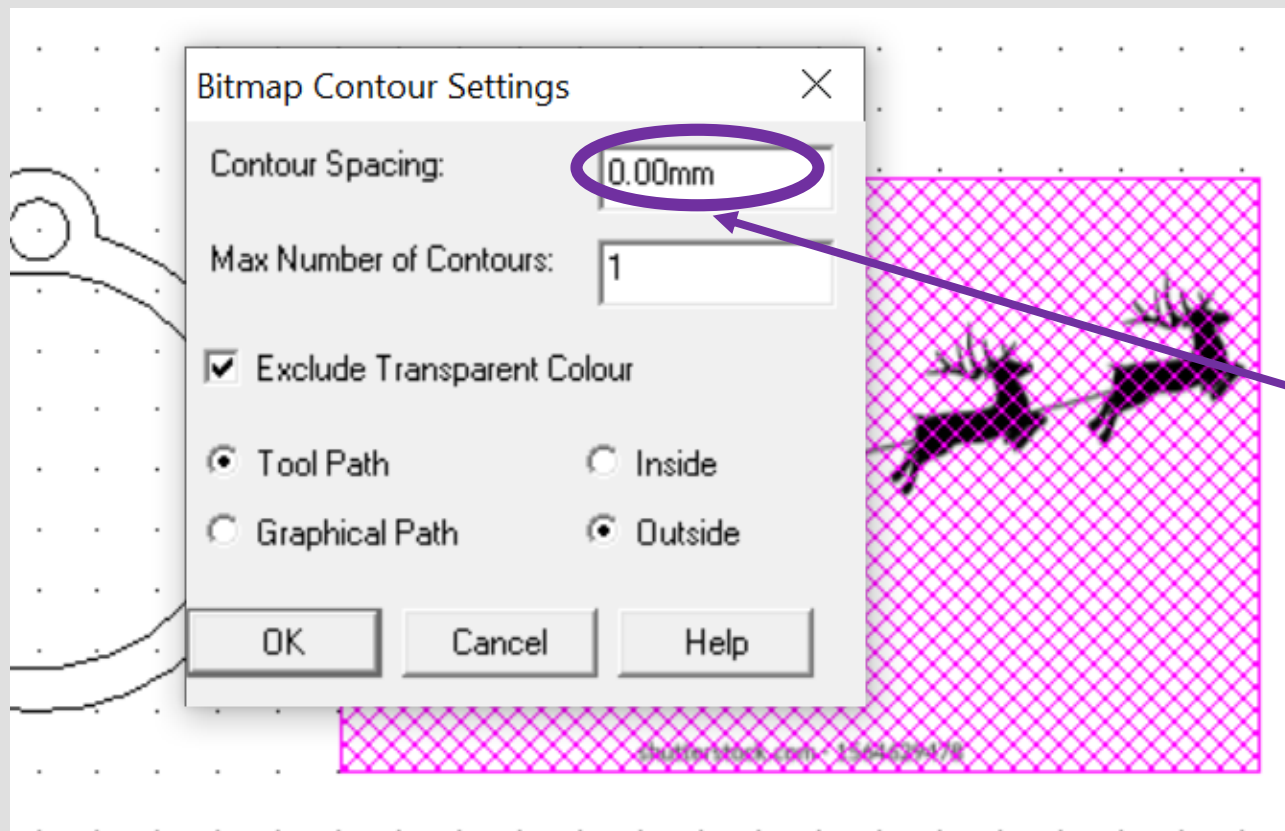
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

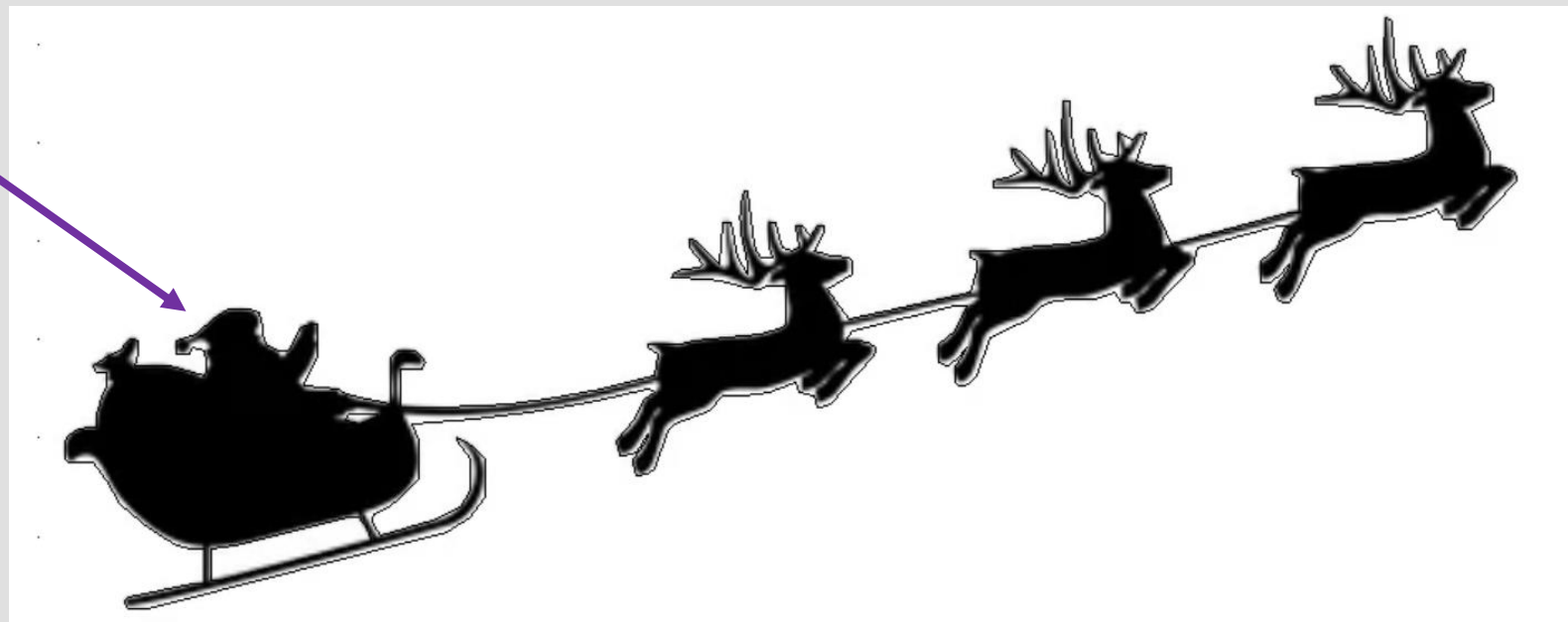
I can connect and apply my knowledge and skills to create ideas and products



20. The **Bitmap Contour** toolbar shown will pop up. Change the *contour spacing* to 0.00



21. **Select** the image and a black outline should appear around the image as if its been *traced*.

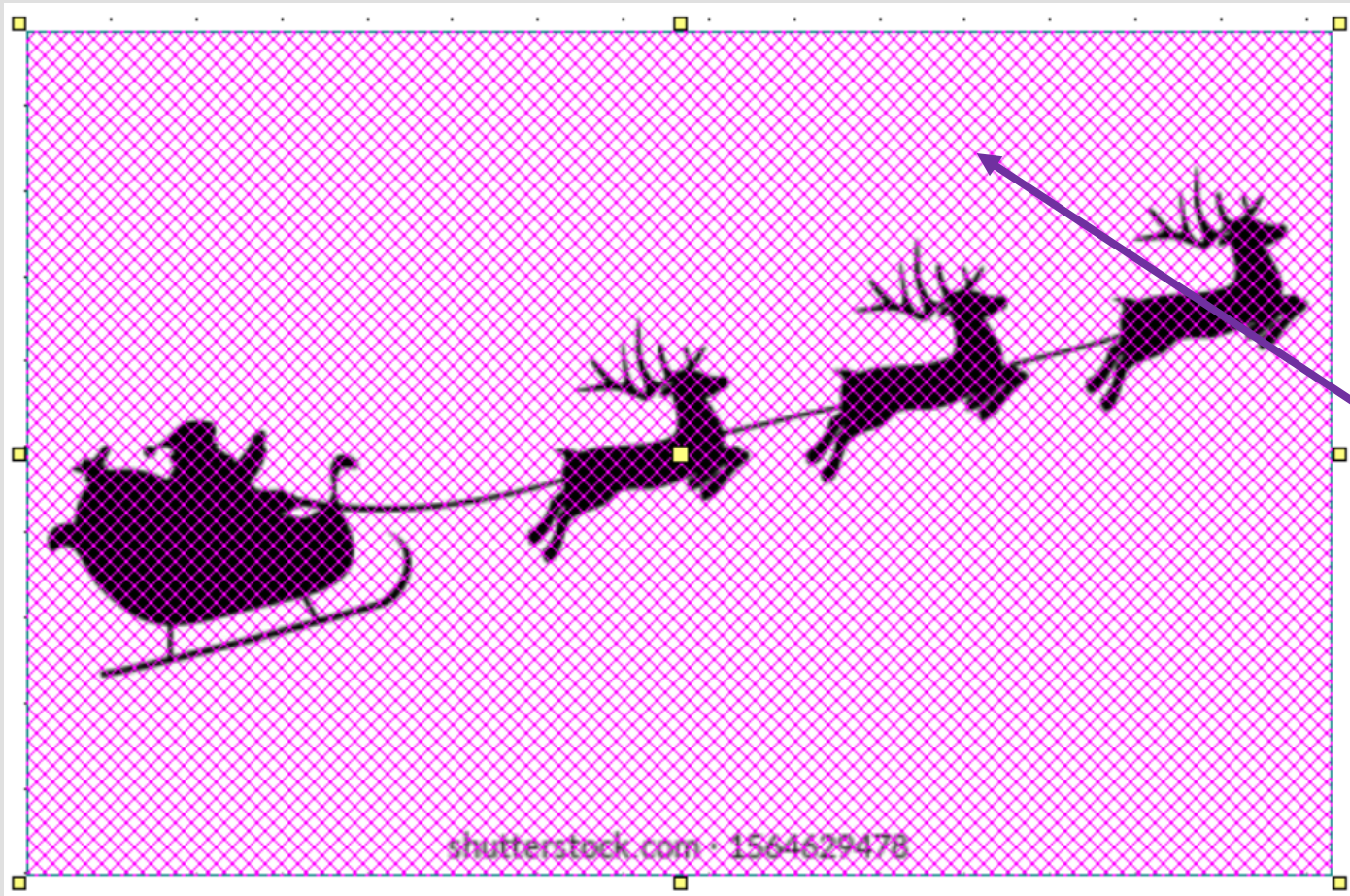
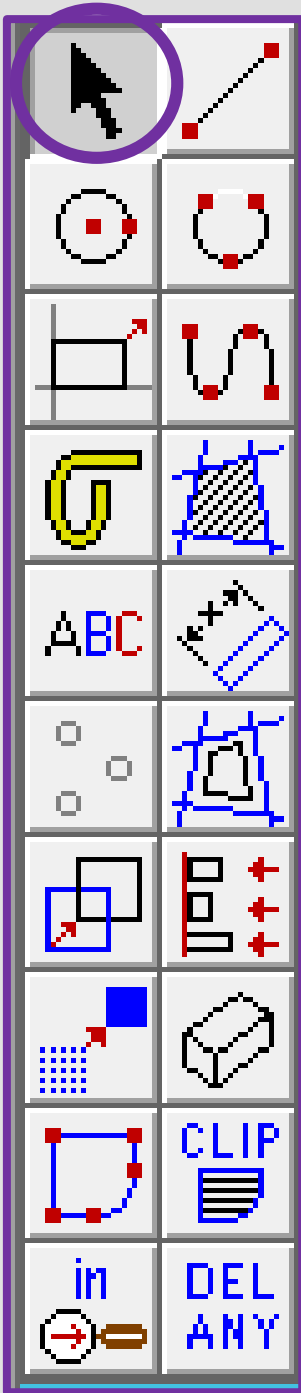


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

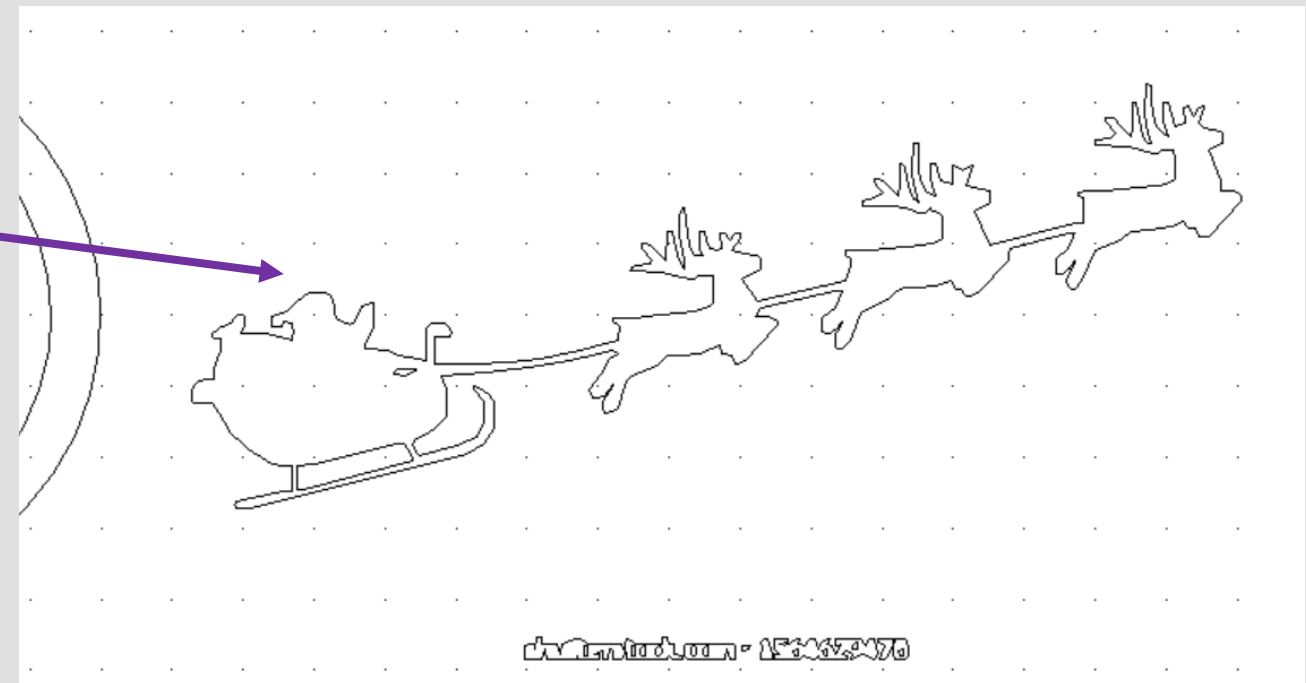


22. Using the ***select tool*** click on the ***actual image*** not the ***contoured traced lines***

Press the ***delete*** button to remove the image



23. You should be left with the ***outline*** of the original image.

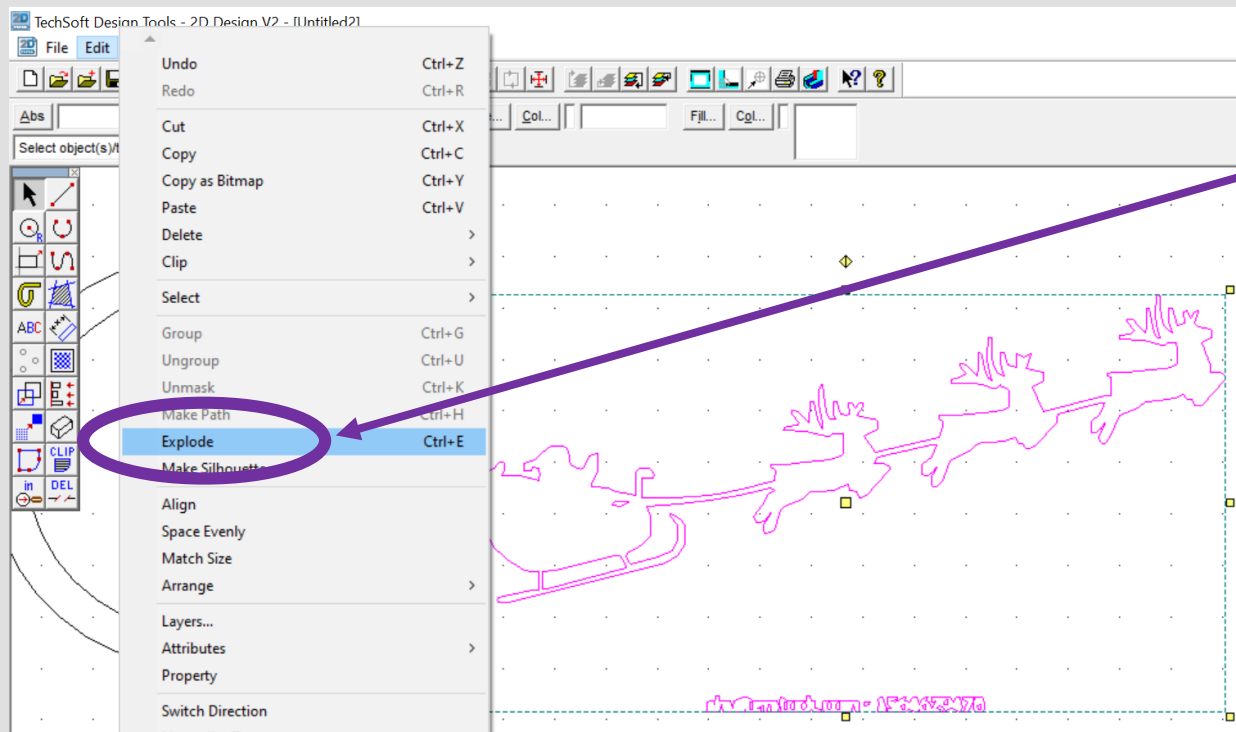


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

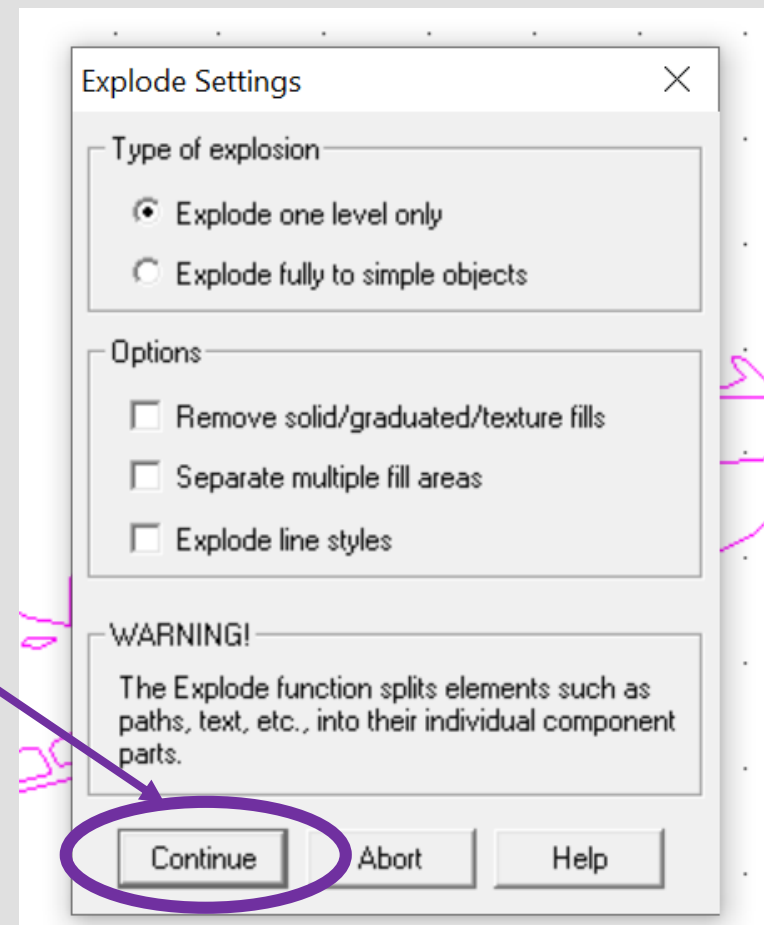
I can connect and apply my knowledge and skills to create ideas and products



24. Using the *select tool*, click on *image* and then the *edit toolbar* at the top. Scroll down to *explode*



25. *The explode settings window should pop up. Press continue.*




Innovation


Digital

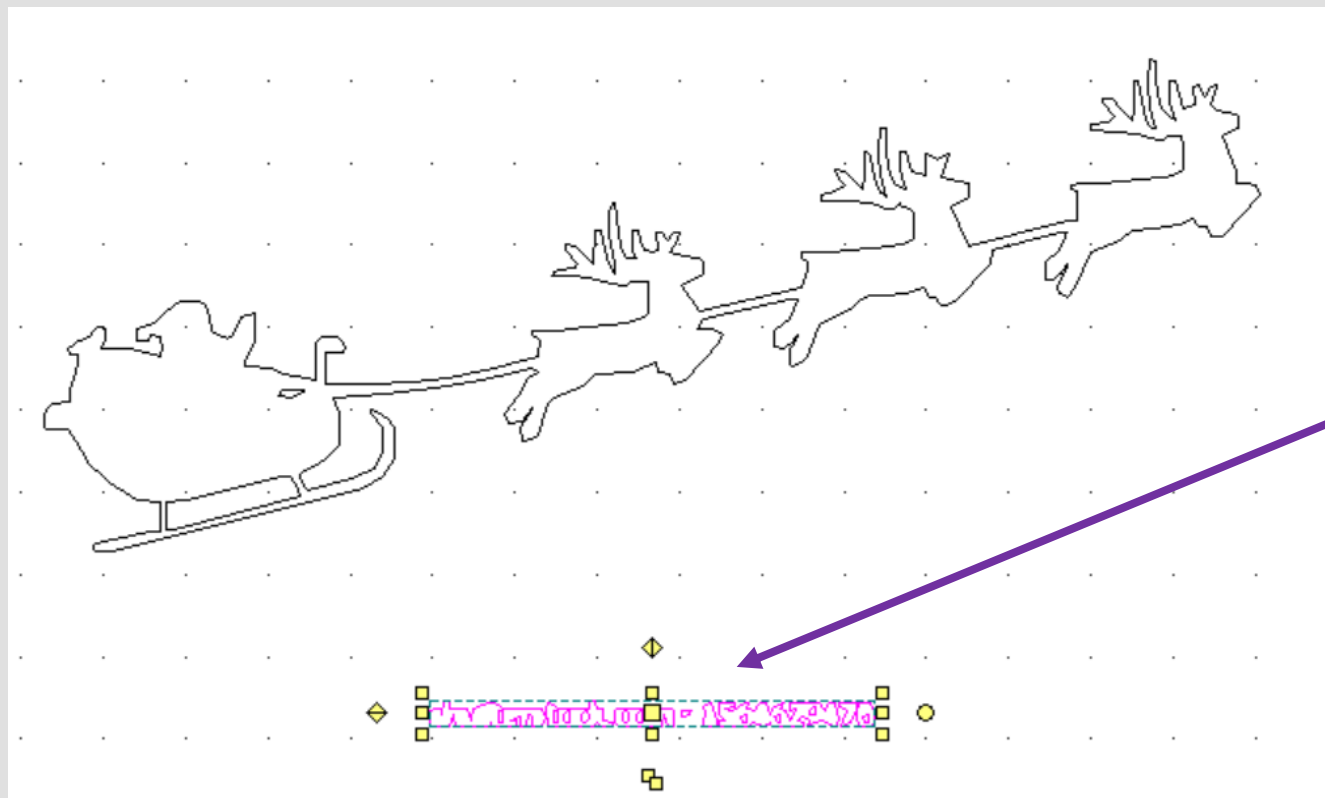

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

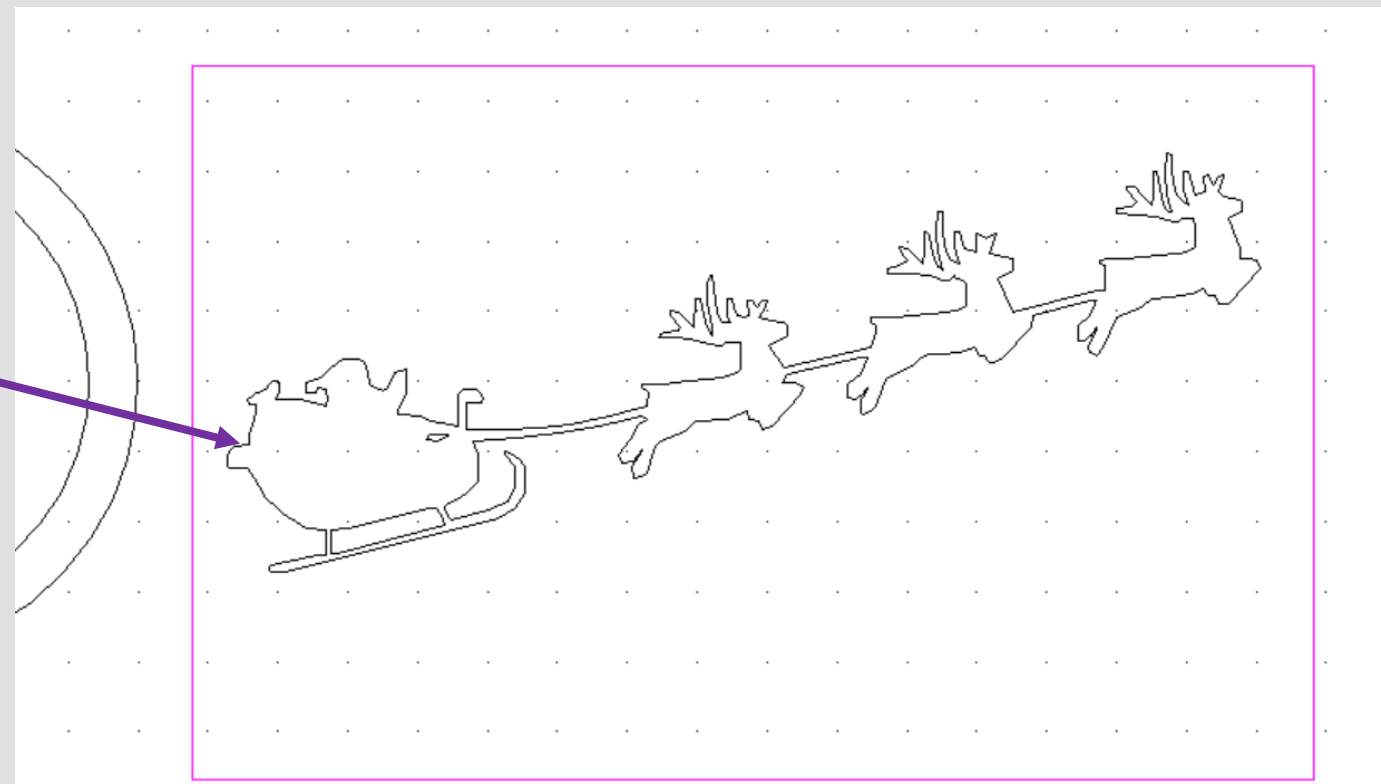
I can connect and apply my knowledge and skills to create ideas and products



26. Using the ***select tool***, click on any writing on your image and press ***delete*** to get rid of it.



27. Using the ***select tool***, drag it over the image to highlight it.

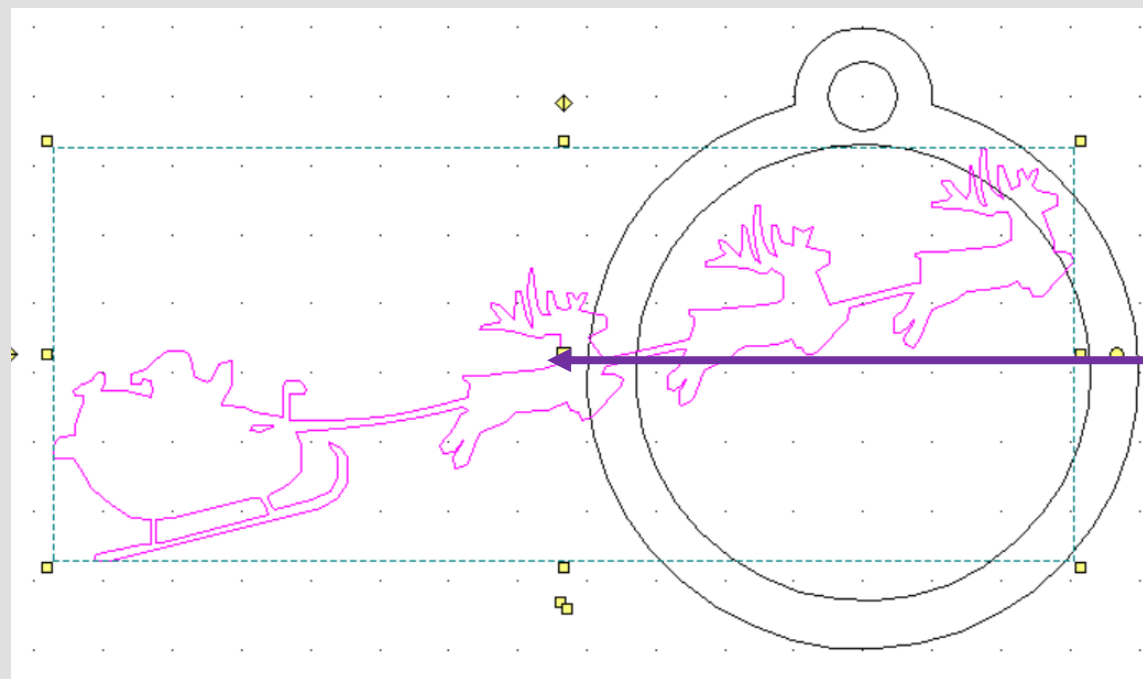


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

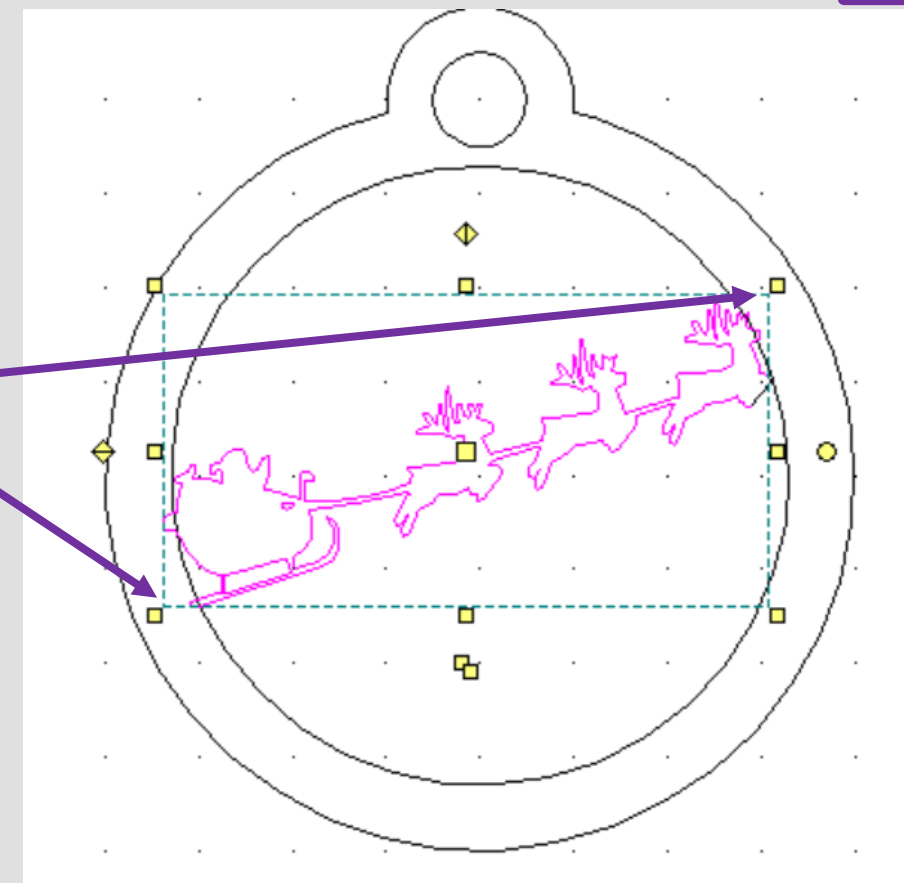
I can connect and apply my knowledge and skills to create ideas and products



28. Then click the *middle square* to move it on to the bauble



29. Using the *select tool*, click on the corner squares to resize so it fits on the bauble

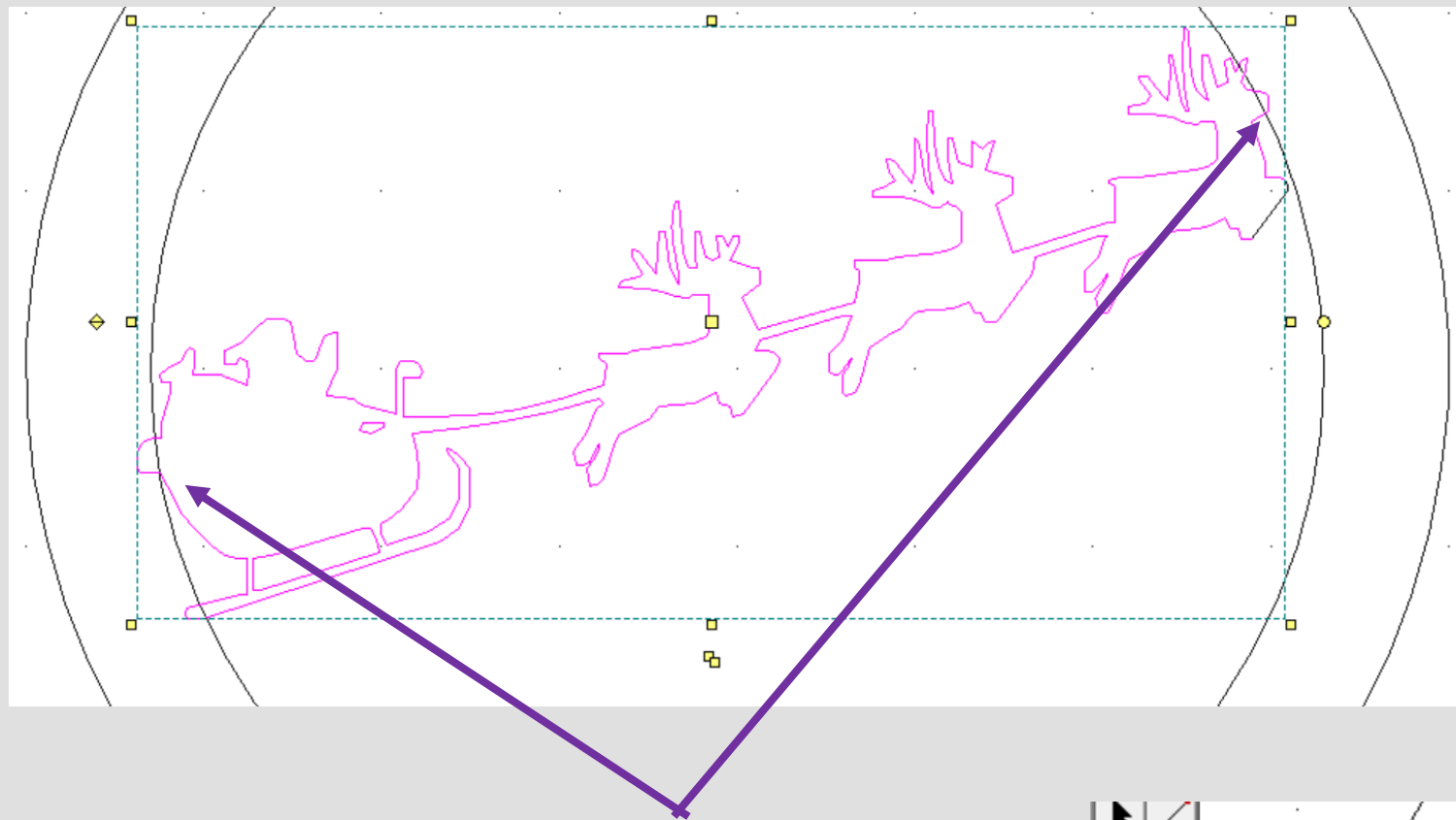


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

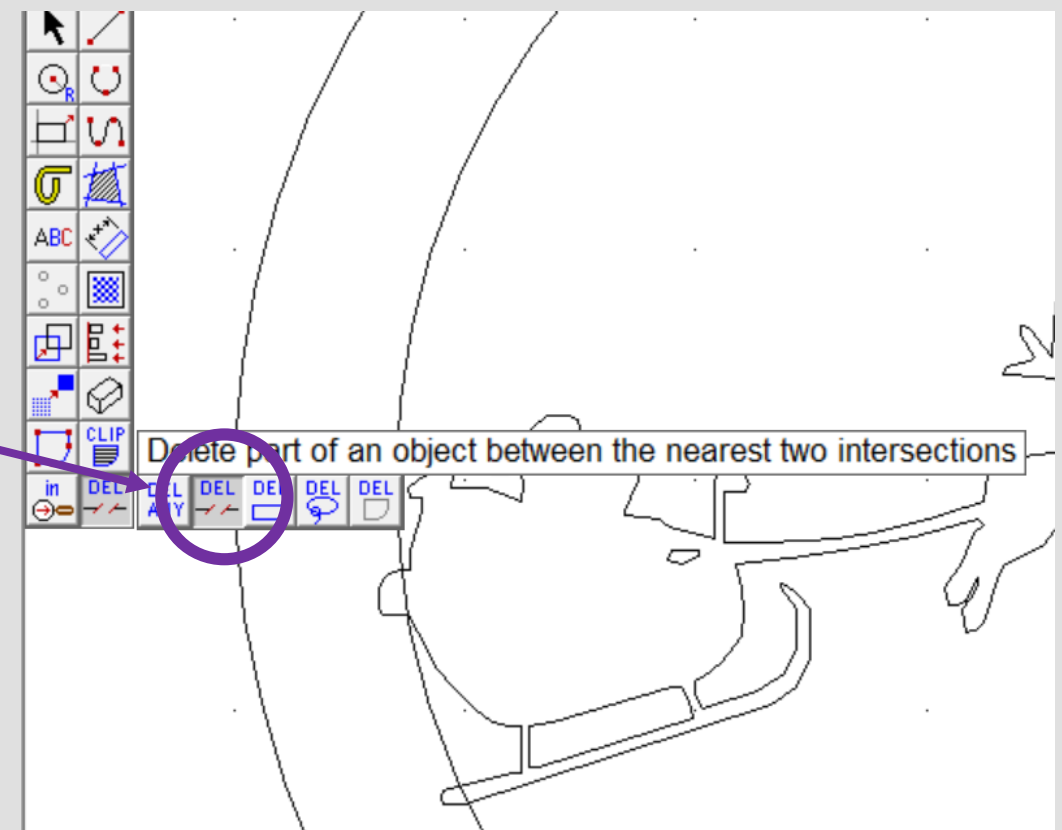
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



30. Using the *select tool*, ensure the image slightly overlaps the inside of the bauble shown above

31. Click and *hold* the *DEL ANY* toolbar down so it *extends* as shown. Click on *DEL PART*.

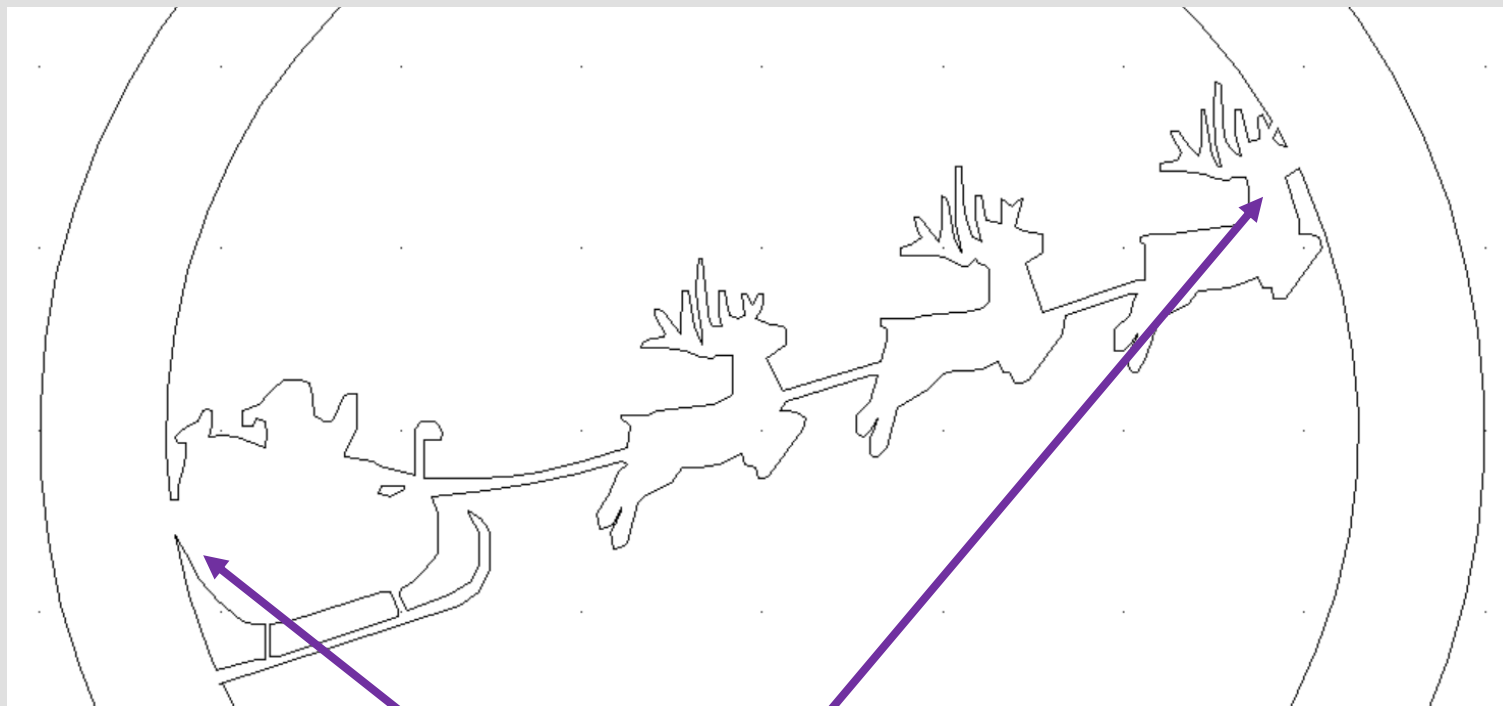


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

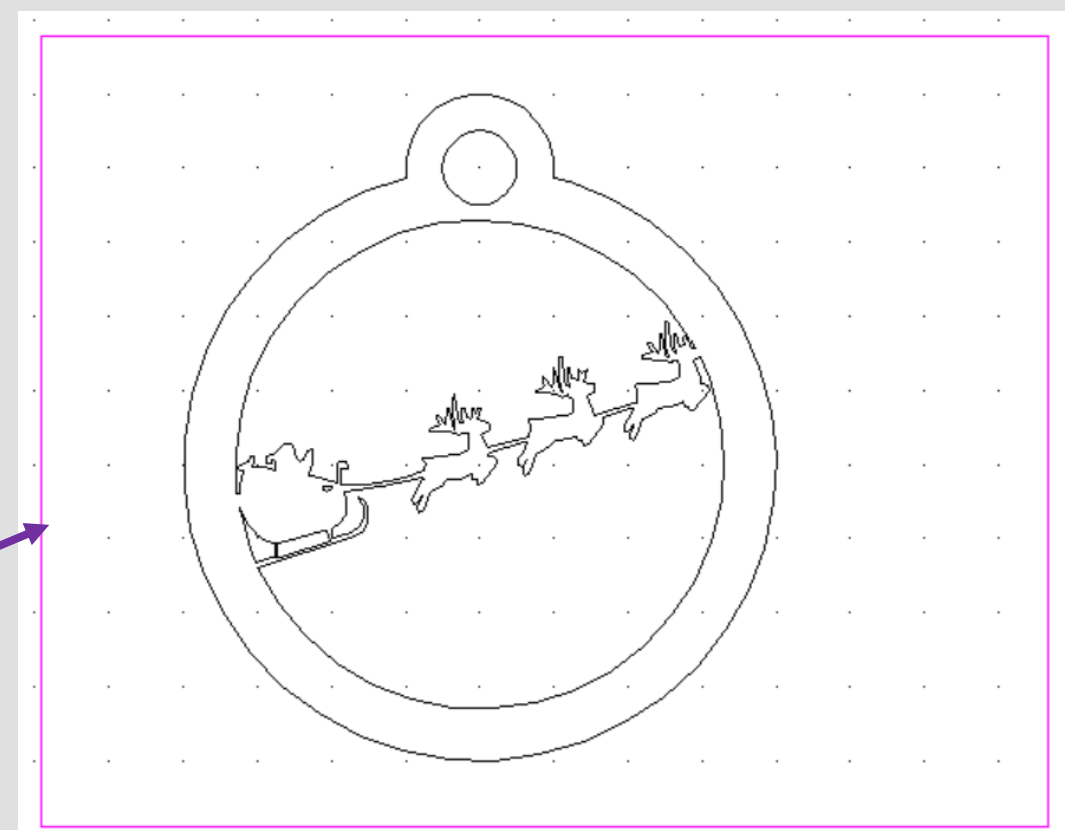
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



32. Using the **DEL PART** tool delete the intersecting lines to make one bauble shape as shown above

33. Using the **select tool**, drag it over the bauble to **select all the parts**.

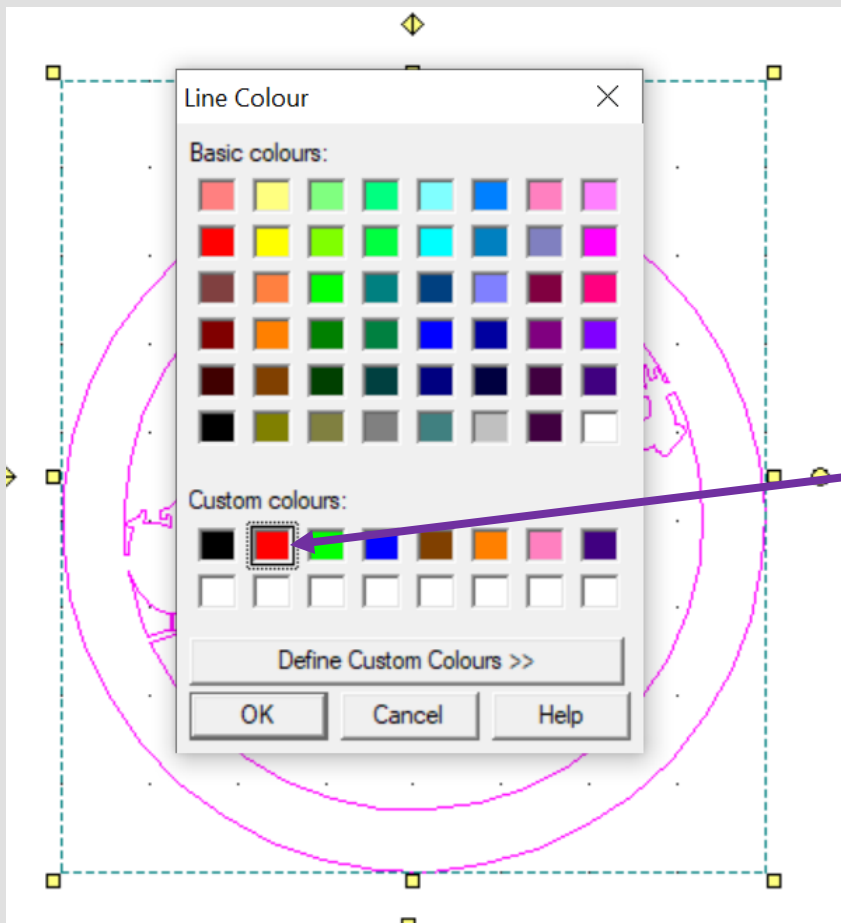


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

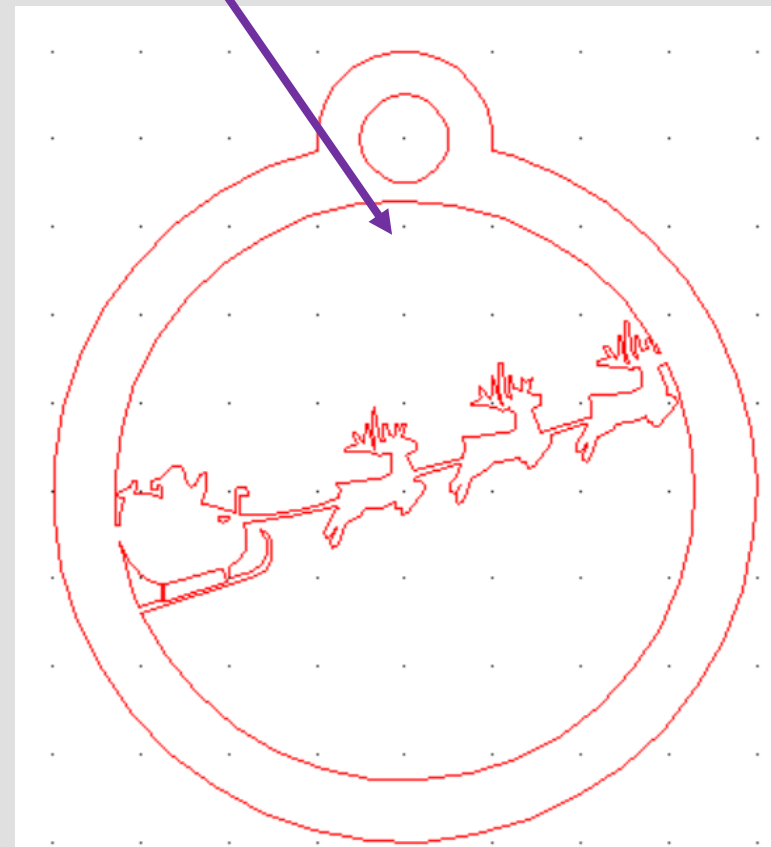
I can connect and apply my knowledge and skills to create ideas and products



34. Using the *select tool*, click on the *line Col button* on the top tool bar.

35. Select the **red colour** from *custom colours*. On the *laser cutter* red is a *cut line*.

This will turn the outline of the bauble red ready to cut out.



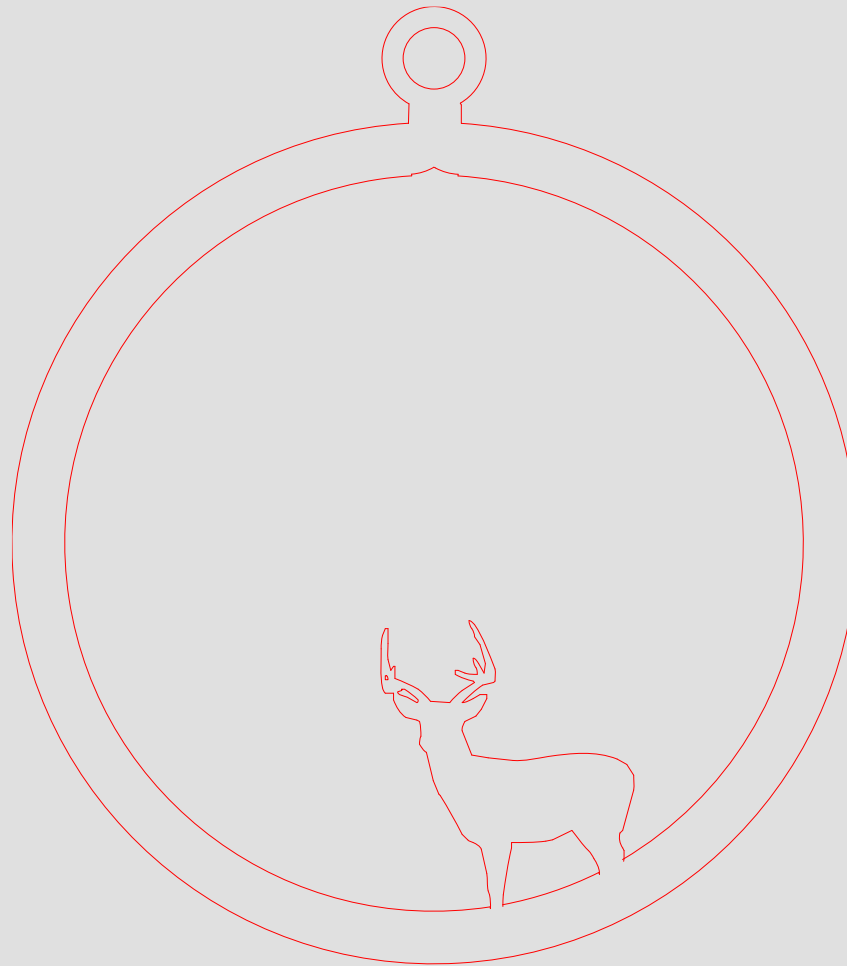
Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

36. *Design your own bauble remember **red** cuts out and **blue** engraves*




Innovation


Digital


Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

Learning Outcomes CAD Skills Checker

Learning Outcomes

- To develop advanced skills and problem solving skills when using 2D Design to draw and manufacture a 2D Christmas Bauble and a 3D Christmas Bauble to scale ready for laser cutting

By the end of this tutorial you will be able to...

- Import images
- Contour Bitmaps
- Draw a Christmas bauble using the correct size radius
- Using the skills you have learnt develop a 3D Christmas tree bauble
- Use the correct line colours to engrave and cut on a laser cutter

New Skills	Advanced Skills
Zoom tool <input type="checkbox"/>	Rotate tool <input type="checkbox"/>
Move tool <input type="checkbox"/>	Contour Bitmap tool <input type="checkbox"/>
Radius tool <input type="checkbox"/>	Vectorise Bitmap tool <input type="checkbox"/>
Line tool <input type="checkbox"/>	Text tool <input type="checkbox"/>
Rectangle tool <input type="checkbox"/>	Arc tool <input type="checkbox"/>
Circle tool <input type="checkbox"/>	Attach tool <input type="checkbox"/>
Eraser tool <input type="checkbox"/>	Contour tool <input type="checkbox"/>
Delete Part tool <input type="checkbox"/>	Line colour tool <input type="checkbox"/>



Innovation



Digital



Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

- connect and apply their knowledge and skills to create ideas and products



3. Laser Cut 3D Christmas Tree Bauble


Innovation


Digital


Problem Solving

Progression Step

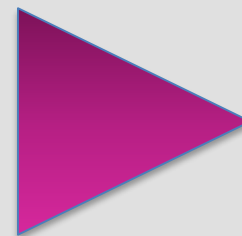
I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products




Press Play




Innovation


Digital


Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

Learning Outcomes CAD Skills Checker

Learning Outcomes

- To develop advanced skills and problem solving skills when using 2D Design to draw and manufacture a 2D Christmas Bauble and a 3D Christmas Bauble to scale ready for laser cutting

By the end of this tutorial you will be able to...

- Import images
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- Draw a Christmas bauble using the correct size radius
- Using the skills you have learnt develop a 3D Christmas tree bauble
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New Skills	Advanced Skills
Zoom tool <input type="checkbox"/>	Rotate tool <input type="checkbox"/>
Move tool <input type="checkbox"/>	Contour Bitmap tool <input type="checkbox"/>
Radius tool <input type="checkbox"/>	Vectorise Bitmap tool <input type="checkbox"/>
Line tool <input type="checkbox"/>	Text tool <input type="checkbox"/>
Rectangle tool <input type="checkbox"/>	Arc tool <input type="checkbox"/>
Circle tool <input type="checkbox"/>	Attach tool <input type="checkbox"/>
Eraser tool <input type="checkbox"/>	Contour tool <input type="checkbox"/>
Delete Part tool <input type="checkbox"/>	Line colour tool <input type="checkbox"/>



Innovation



Digital



Problem Solving

Progression Step

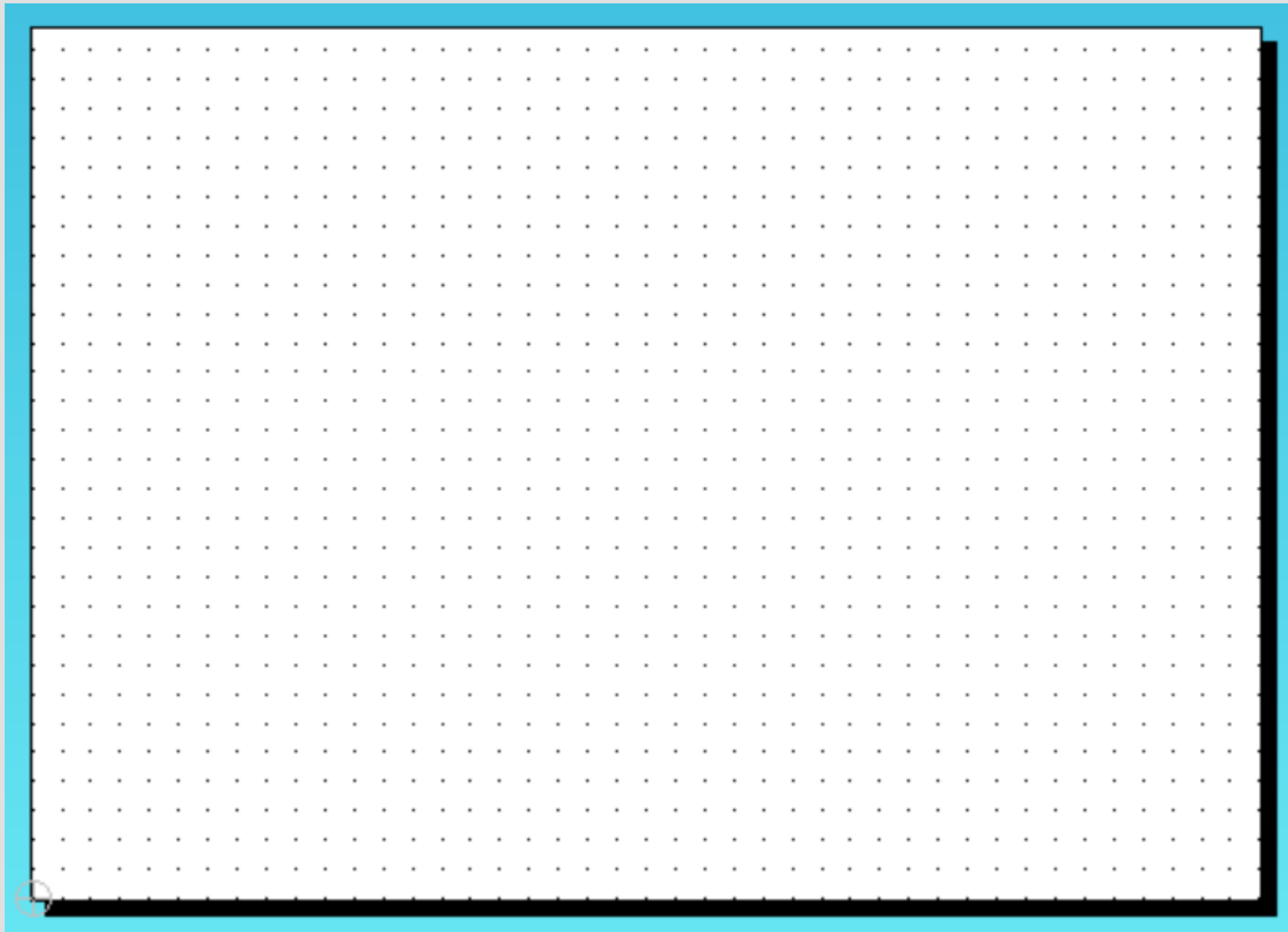
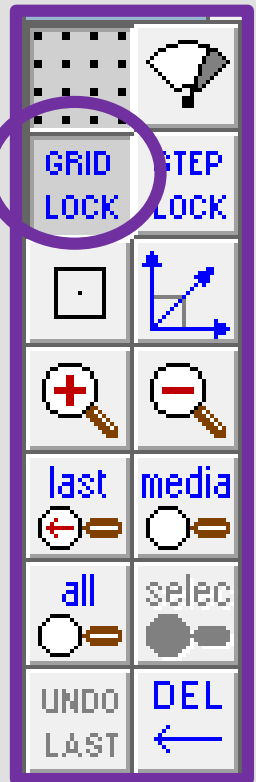
I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

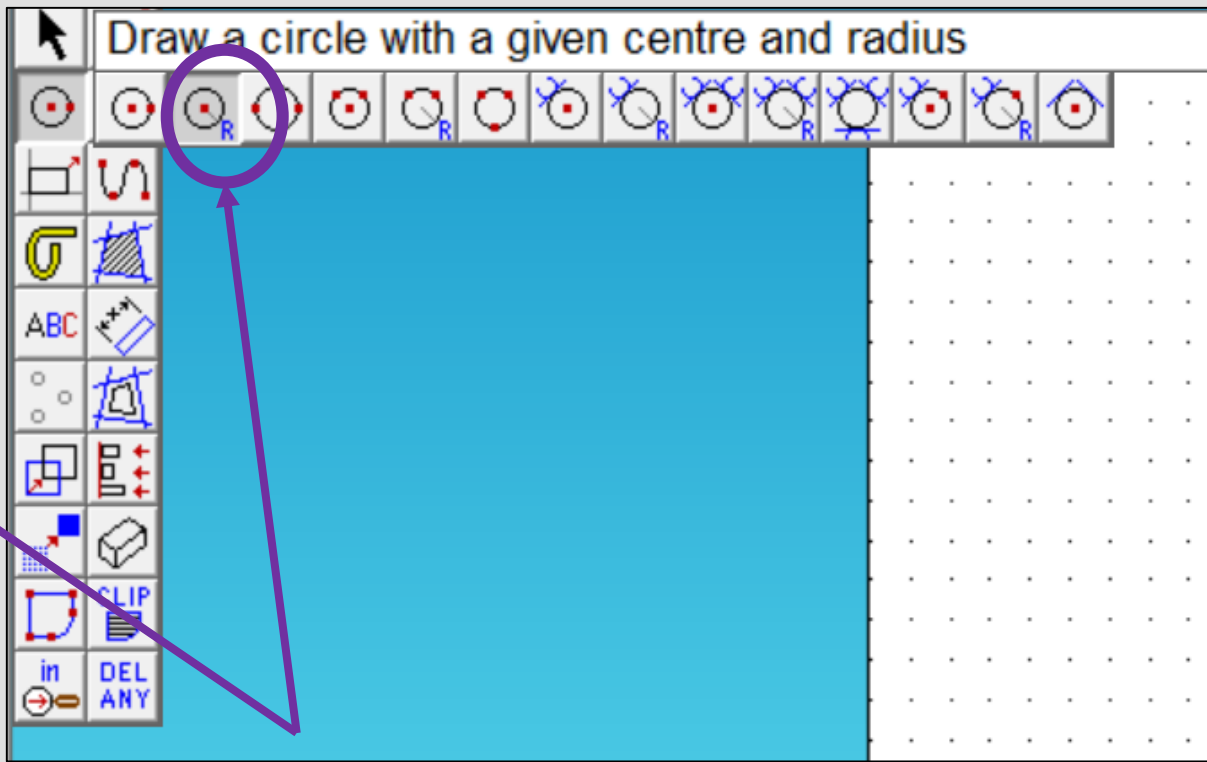
Learning Outcome

- connect and apply their knowledge and skills to create ideas and products



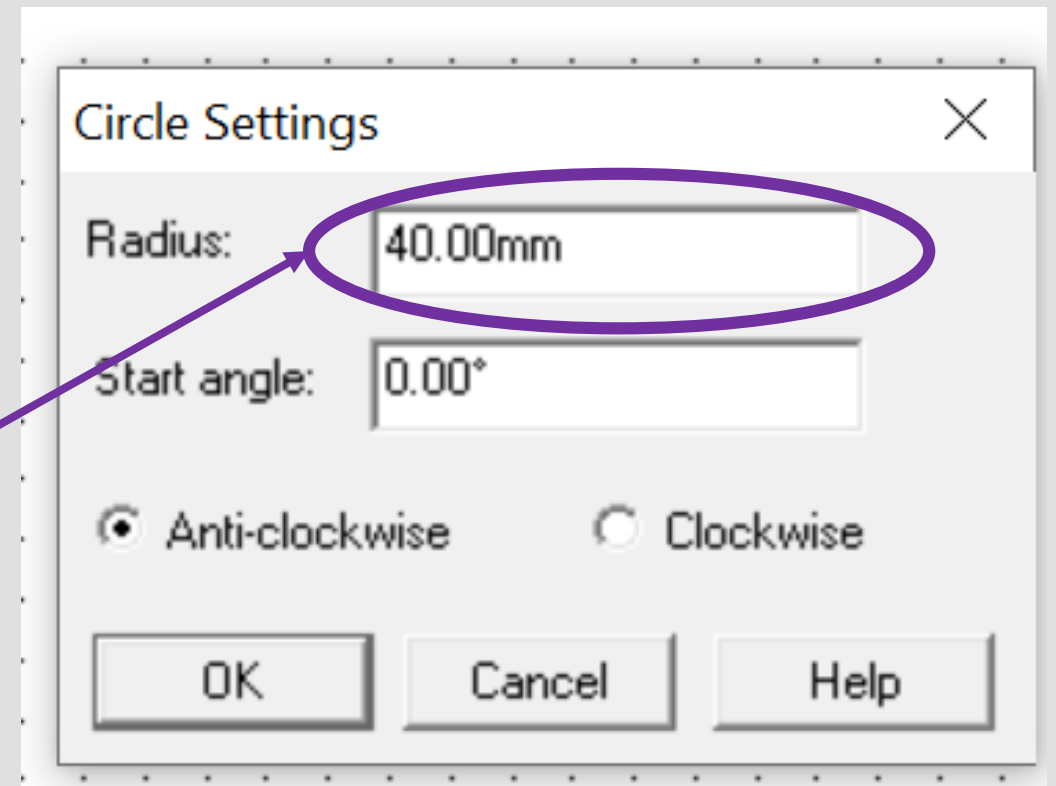
1. Click the *grid lock tool* shown on





2. **Click** and hold on the *circle tool* until it extends out as shown above. Click on the second one in a circle with a **given centre and radius**

3. In the **circle settings** box type in **40.00** in the radius box and **press enter**



Innovation



Digital



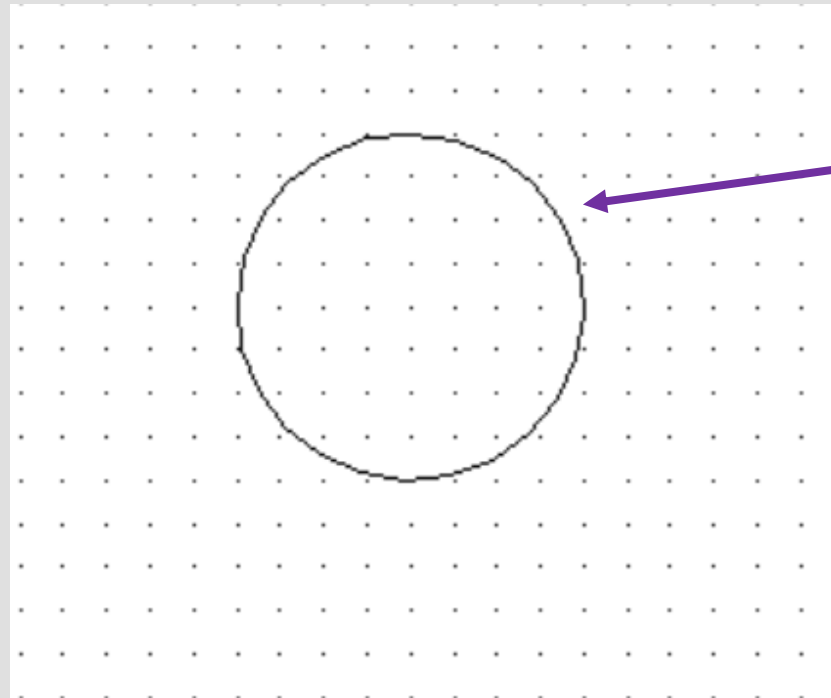
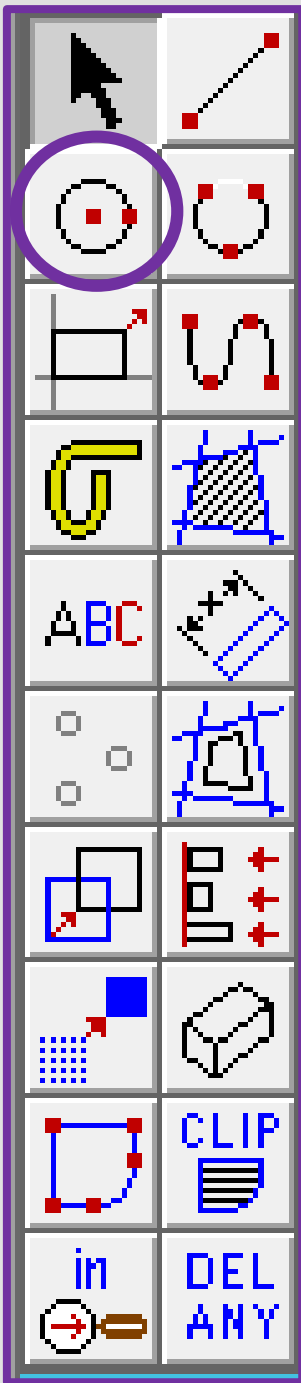
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

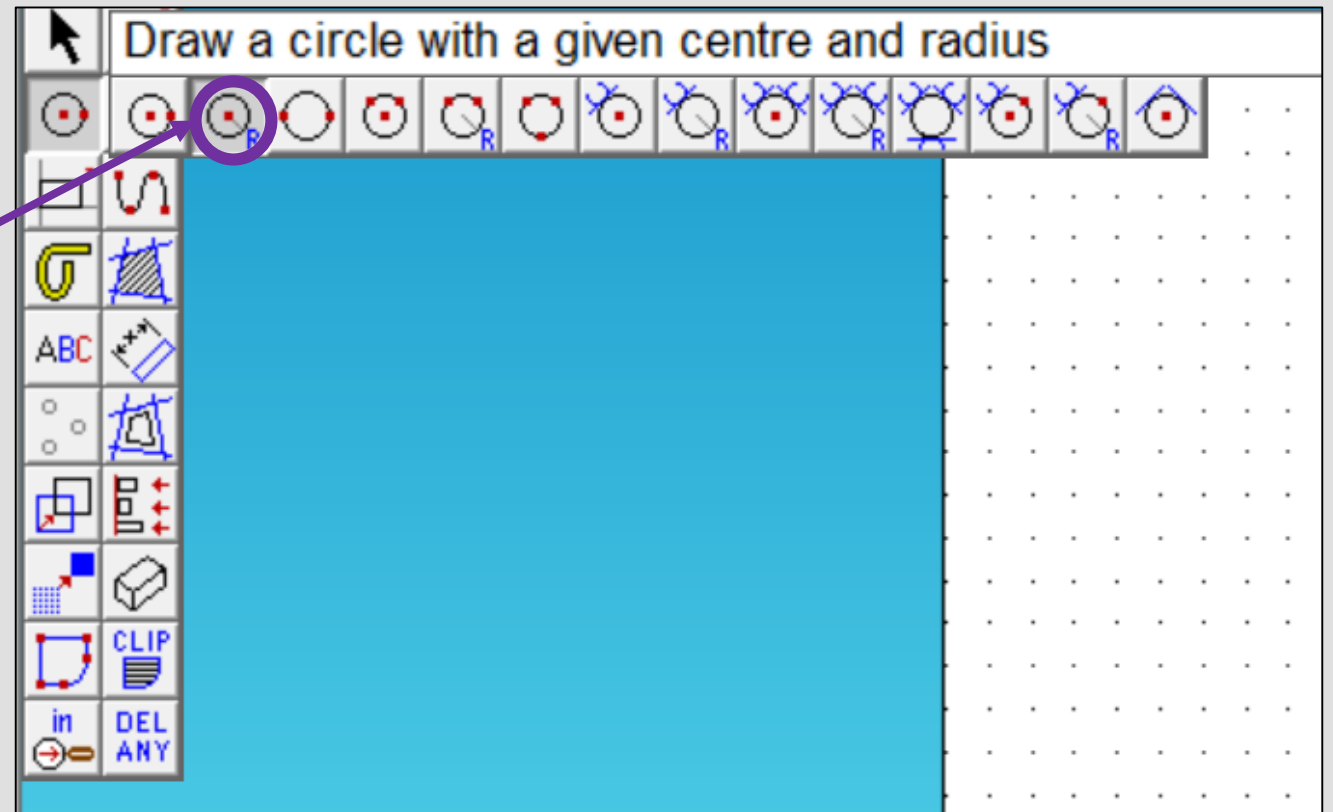
I can connect and apply my knowledge and skills to create ideas and products



4. Position the circle on the page.



5. Click and the circle with a **given centre and radius**. It should be selected from last time.

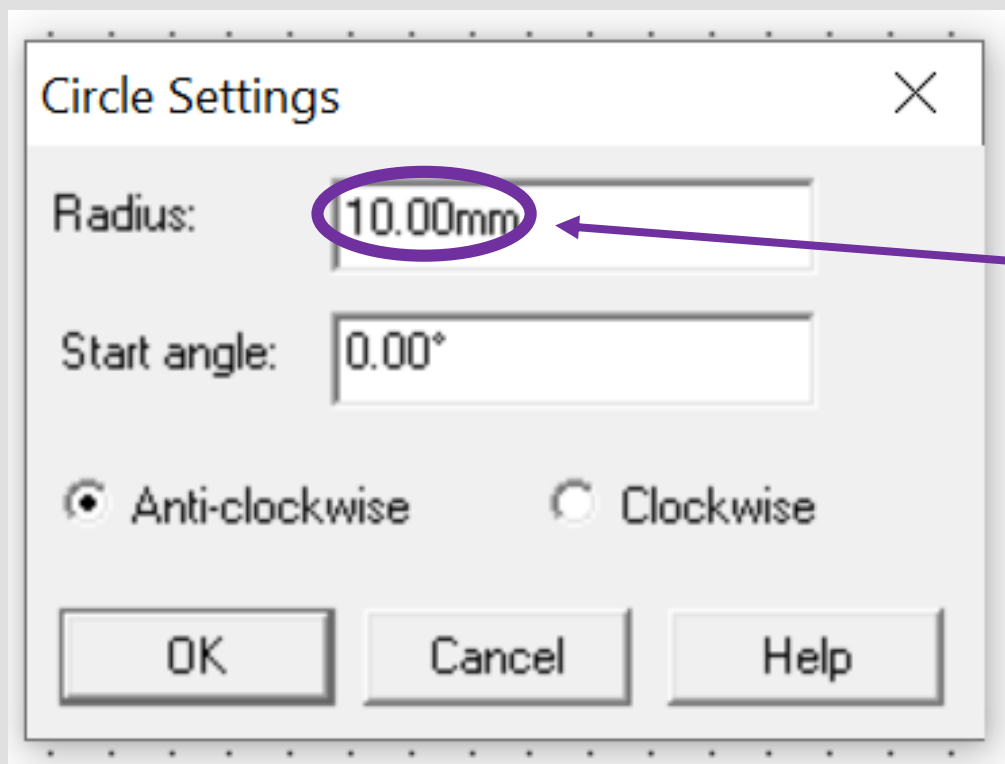
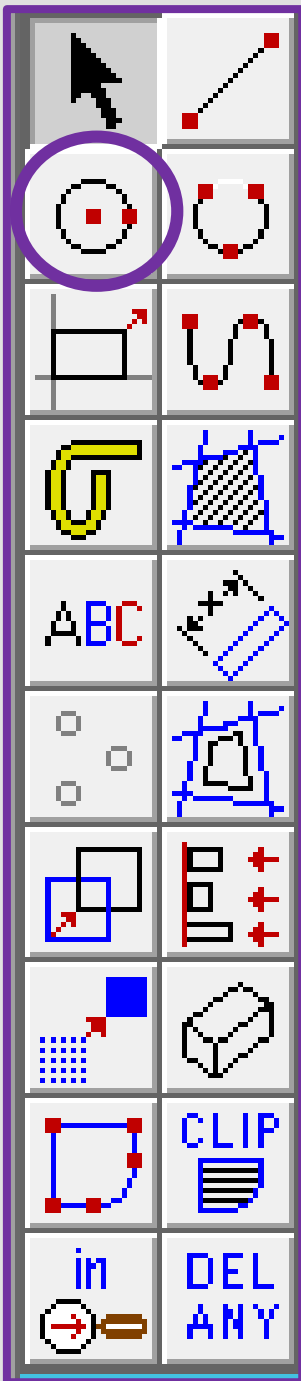


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

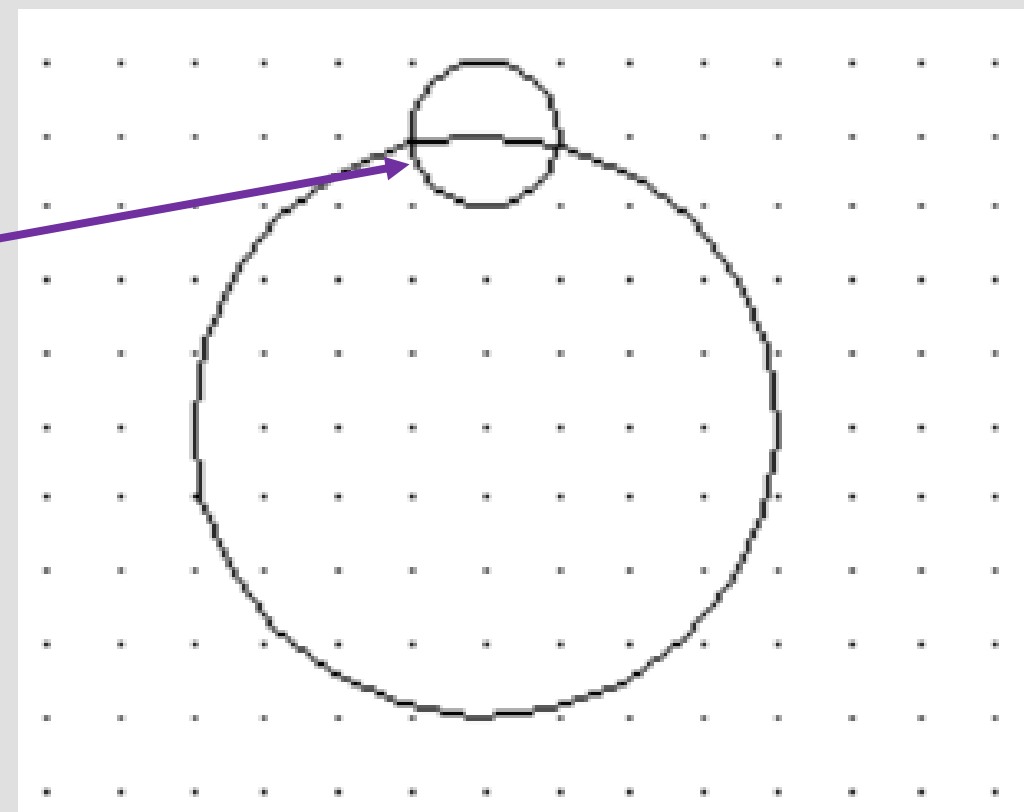
I can connect and apply my knowledge and skills to create ideas and products



6. In the **circle settings** box type in **10.00** in the radius box and **press enter**



7. **Position** the **circle** shown over the first circle shown opposite

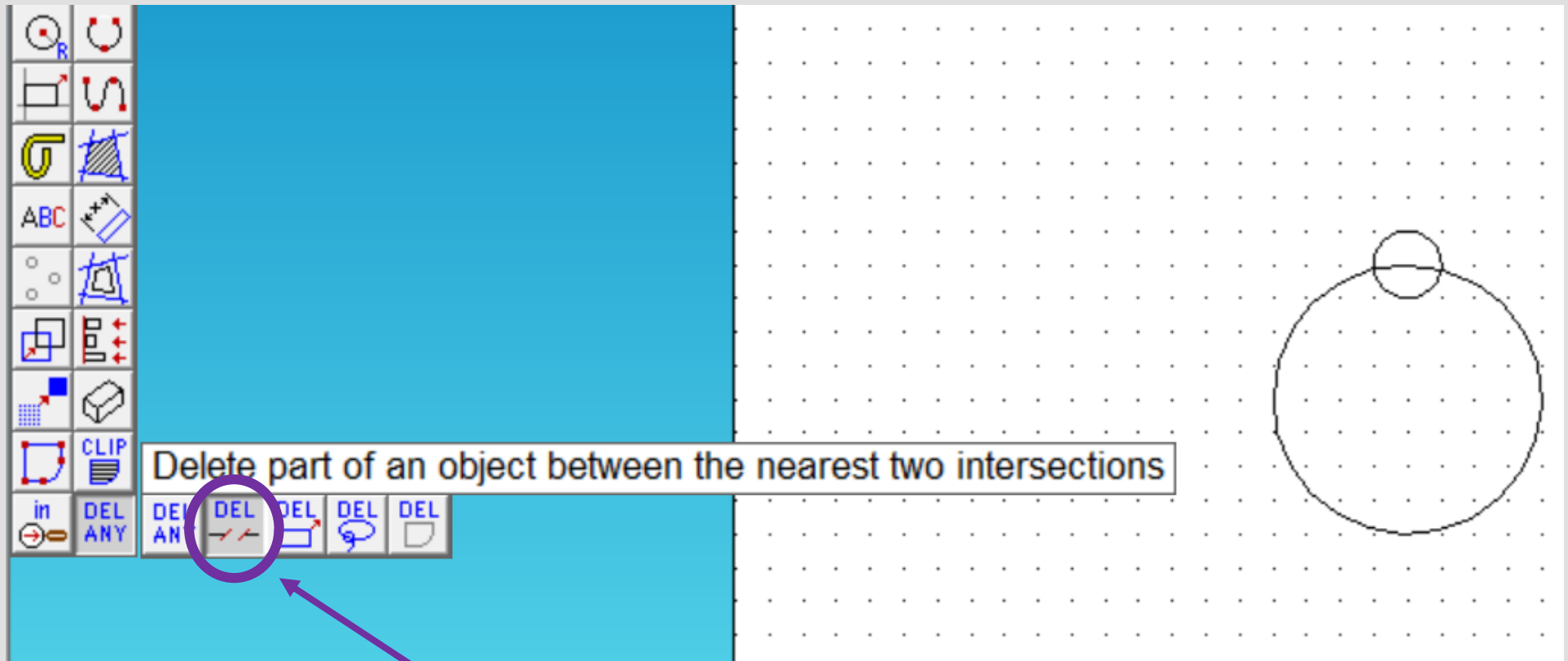
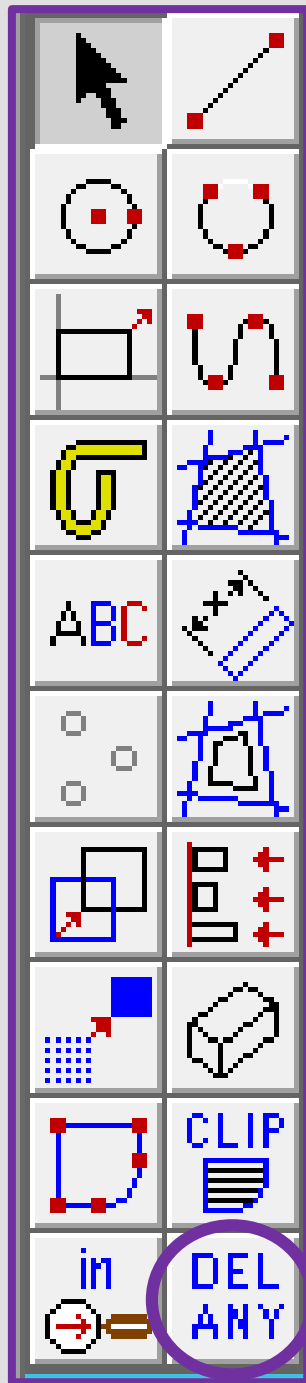


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

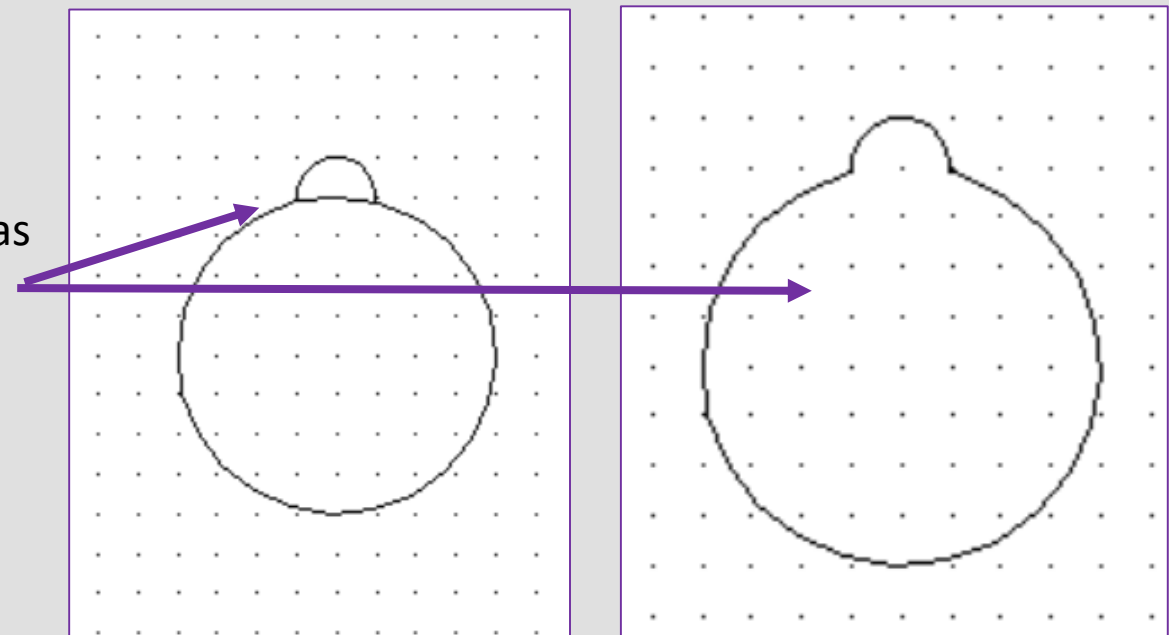
Learning Outcome

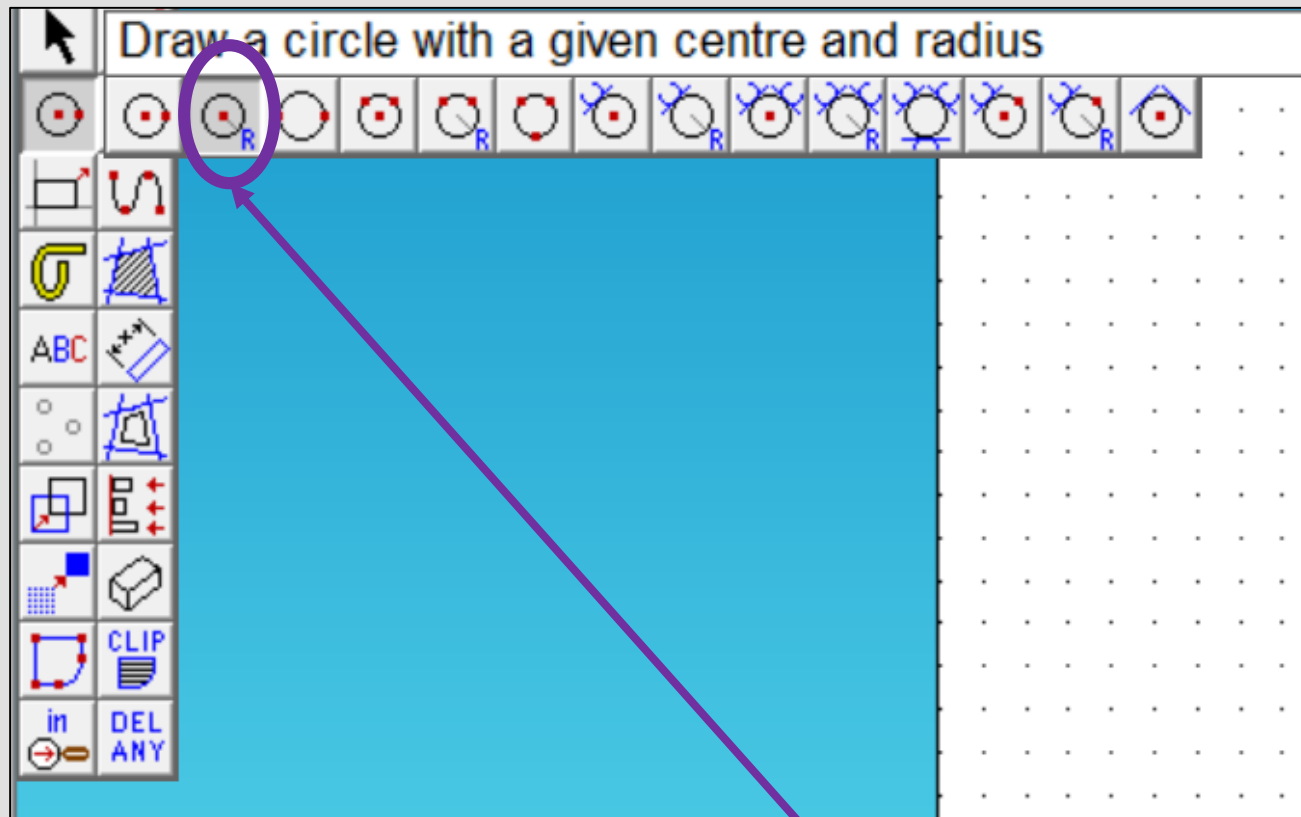
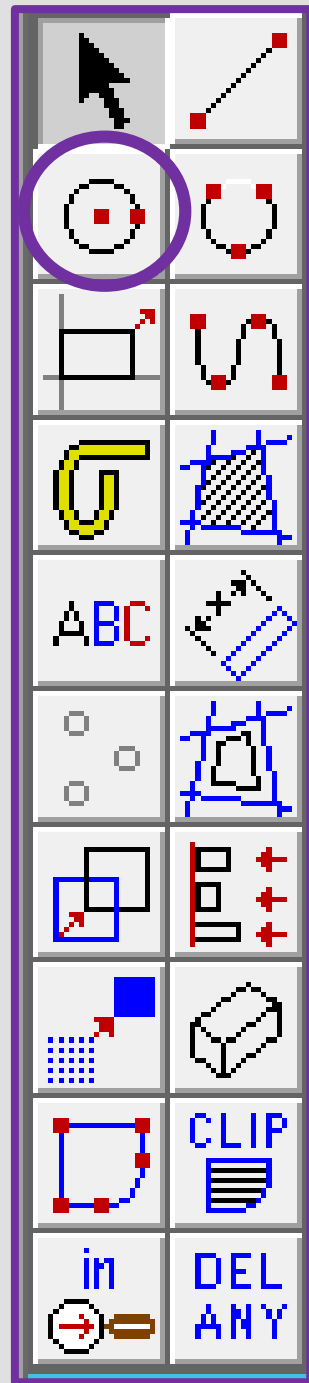
I can connect and apply my knowledge and skills to create ideas and products



8. Click and **hold** the **DEL ANY** toolbar down so it **extends** as shown. Click on **DEL PART**.

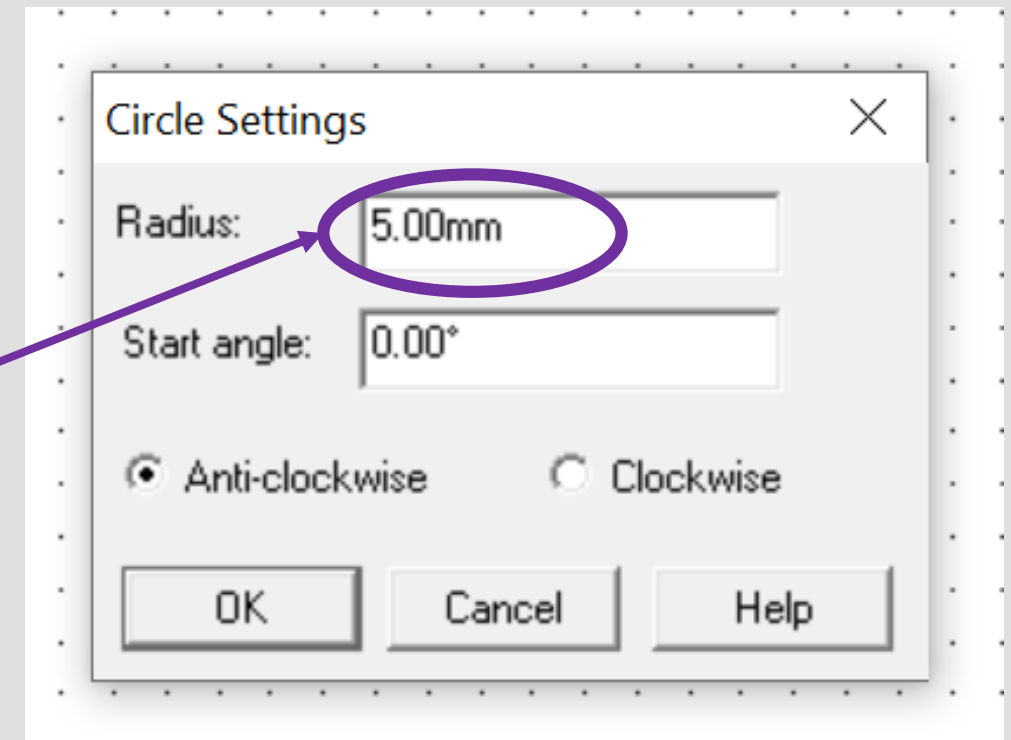
9. Using the **DEL PART** tool delete the intersecting lines to make one Christmas tree bauble shape as shown opposite

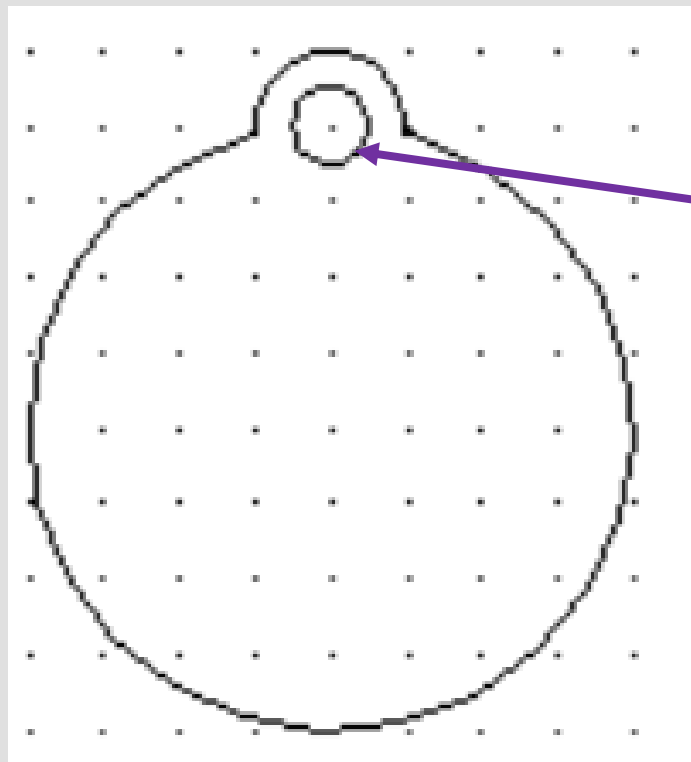
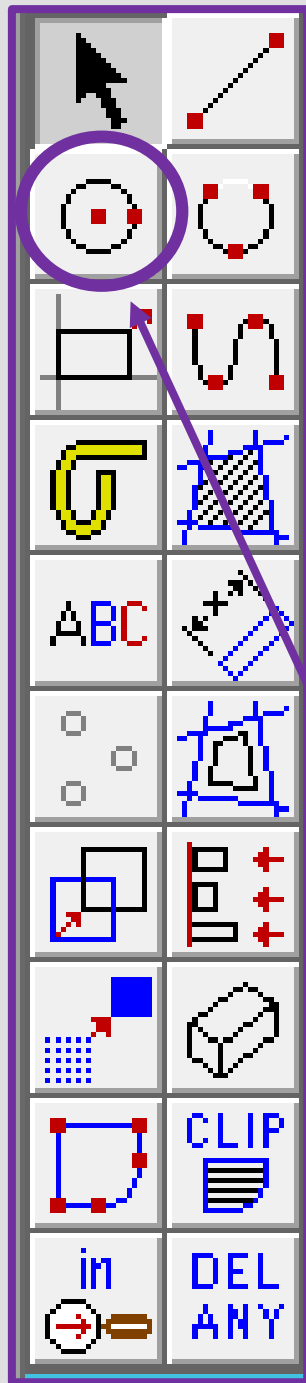




10. **Click** and the circle with a *given centre and radius*. It should be selected from last time.

11. In the **circle settings** box type in **5.00** in the radius box and **press enter**



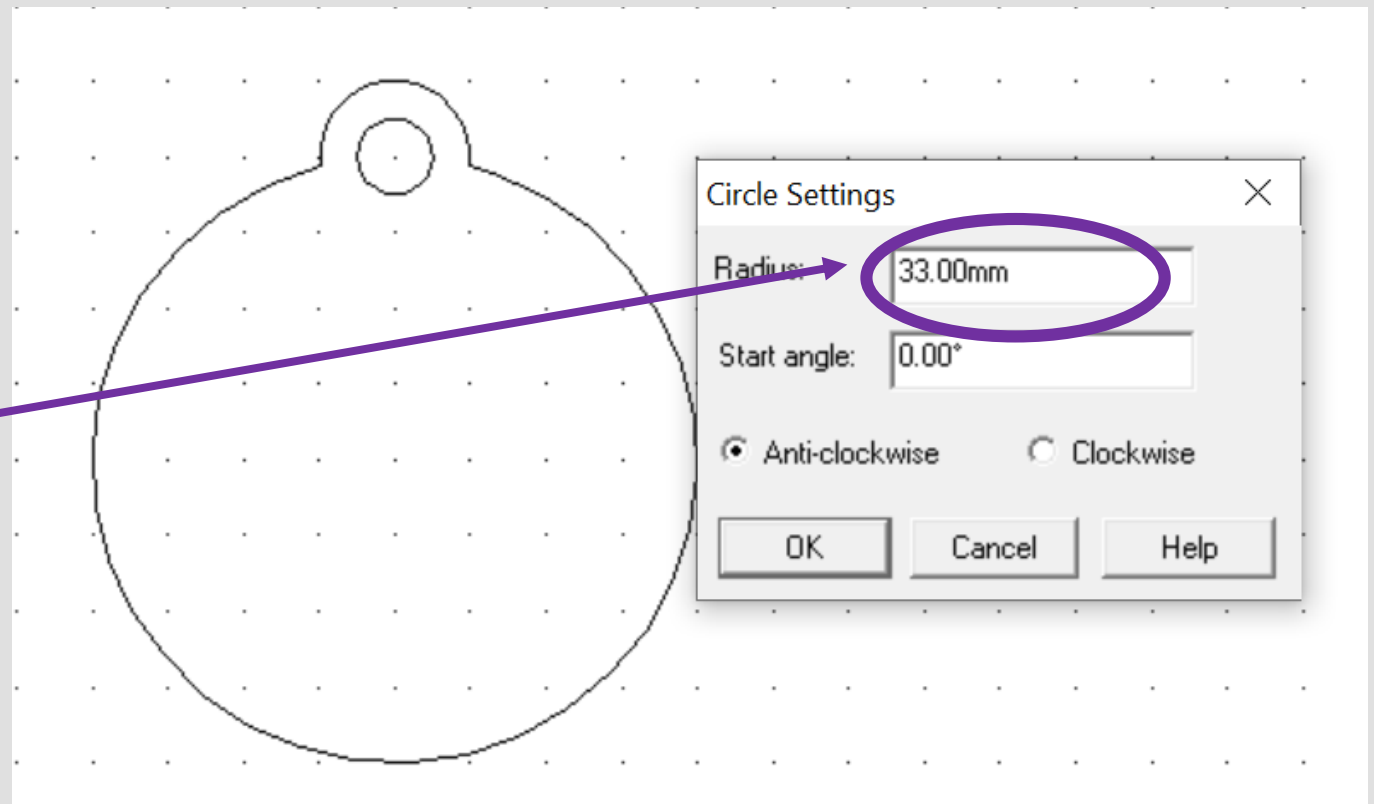


12. **Position** the **circle** shown in the circle shown opposite. This is the hole to attach string or push the branch of your Christmas tree through



13. **Click** and the circle with a **given centre and radius**. It should be selected from last time.

14. In the **circle settings** box type in **33.00** in the radius box and **press enter**



Innovation



Digital



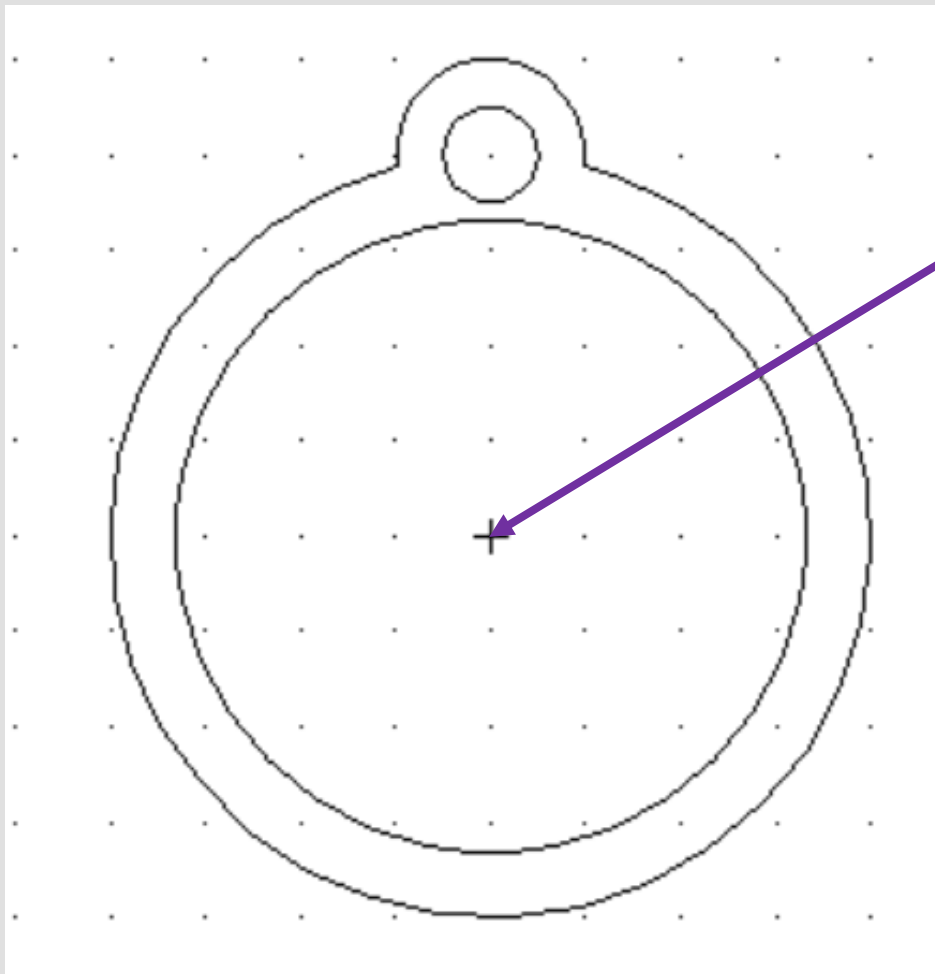
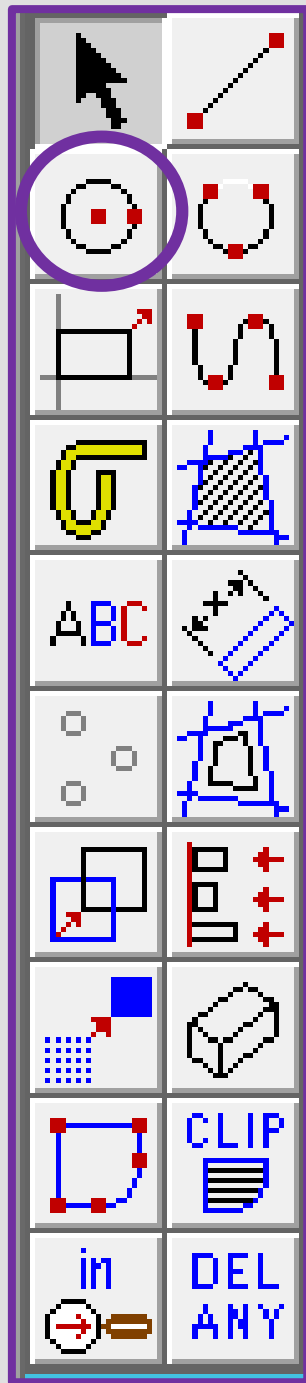
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

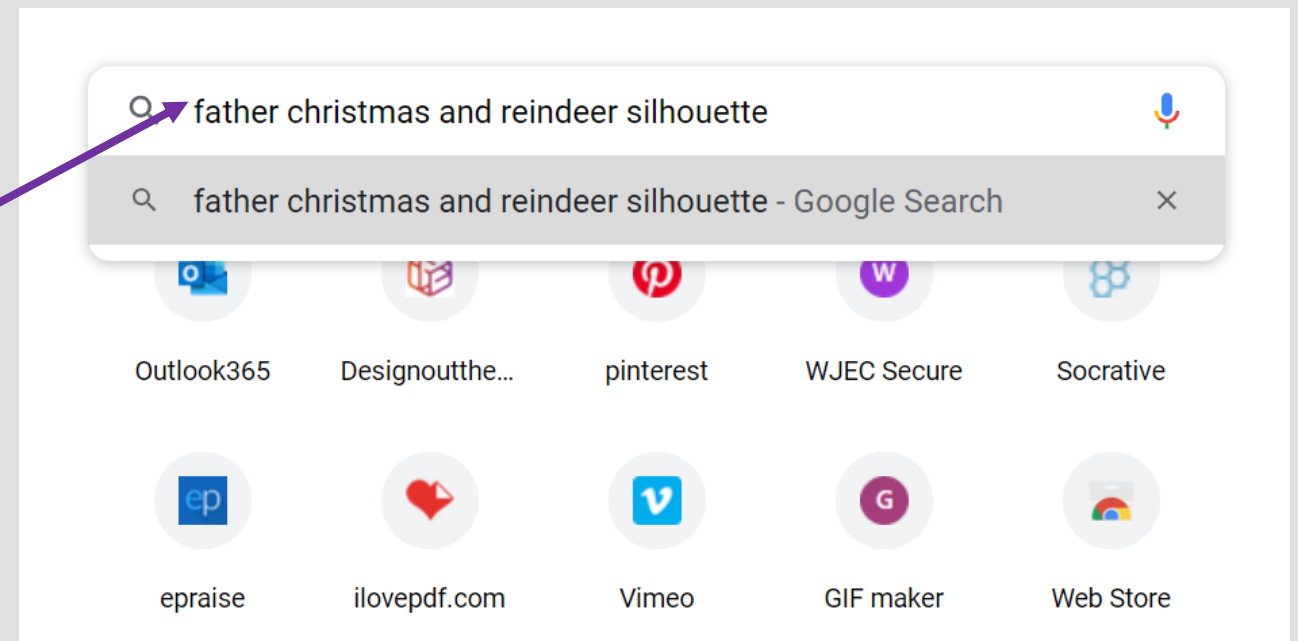
I can connect and apply my knowledge and skills to create ideas and products



14. **Position** the **circle** shown in the circle in the middle of the bauble as shown opposite.



15. Using google chrome search for a *father Christmas and reindeer silhouette*.




Innovation


Digital

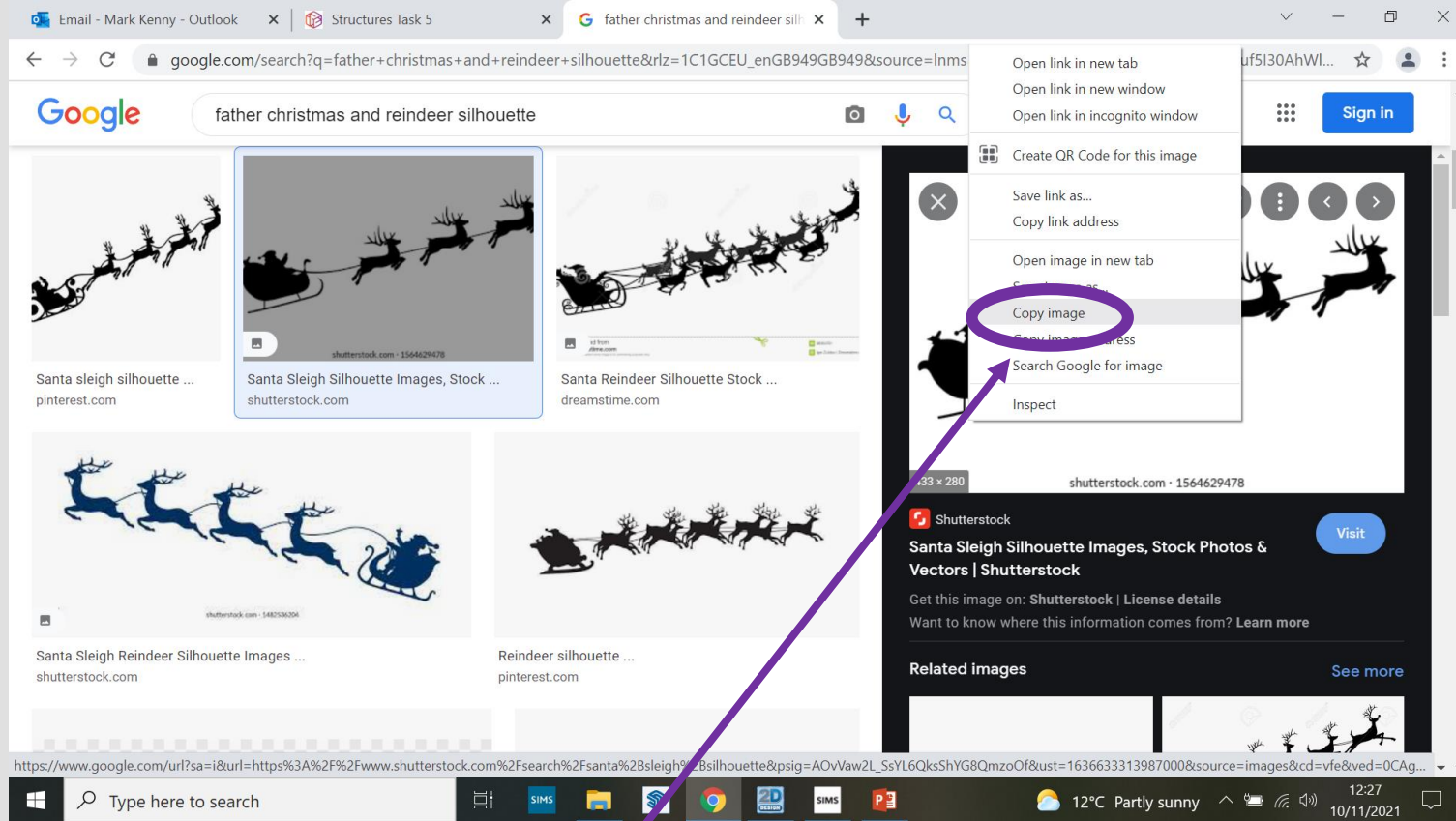

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

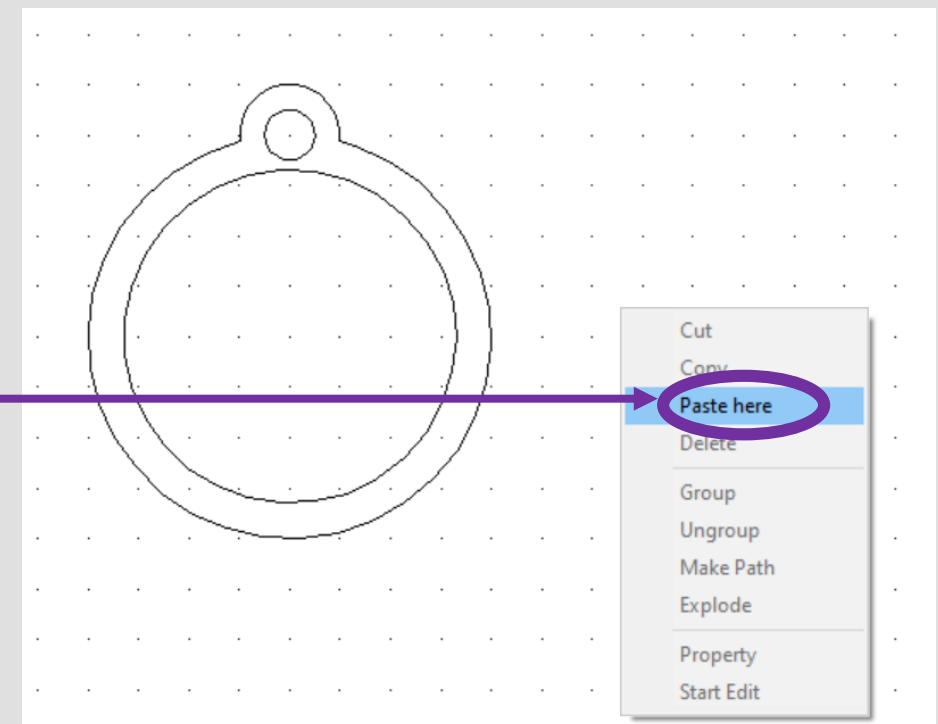
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



16. Once you have found a image you like. **Right click** and **Copy image**

17. In **2D design** **right click** and **select paste here.**




Innovation


Digital

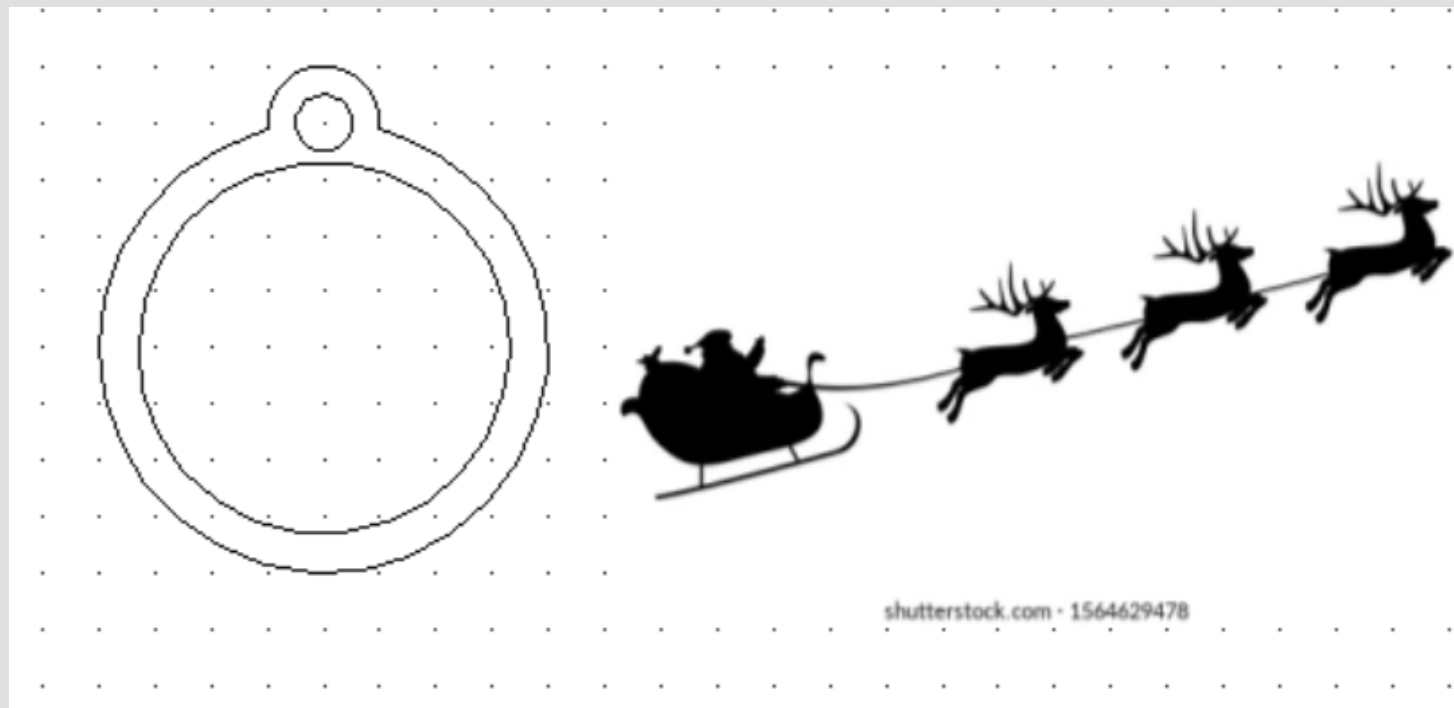

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

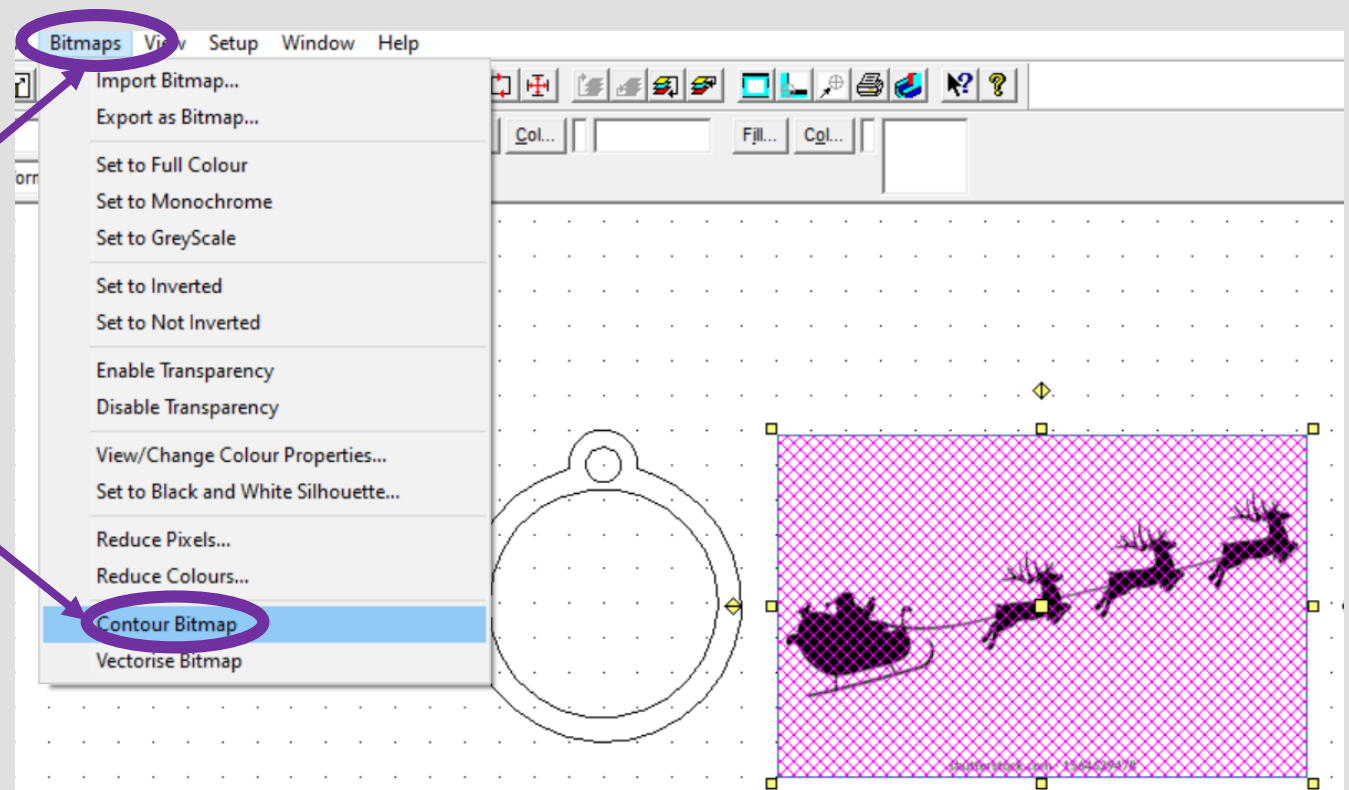
I can connect and apply my knowledge and skills to create ideas and products



18. Your image should copy straight into 2D design as shown opposite.



19. Select the image and then the **bitmaps toolbar** shown on the top toolbar and in the circle shown opposite. Go down to **contour bitmap**



Innovation



Digital



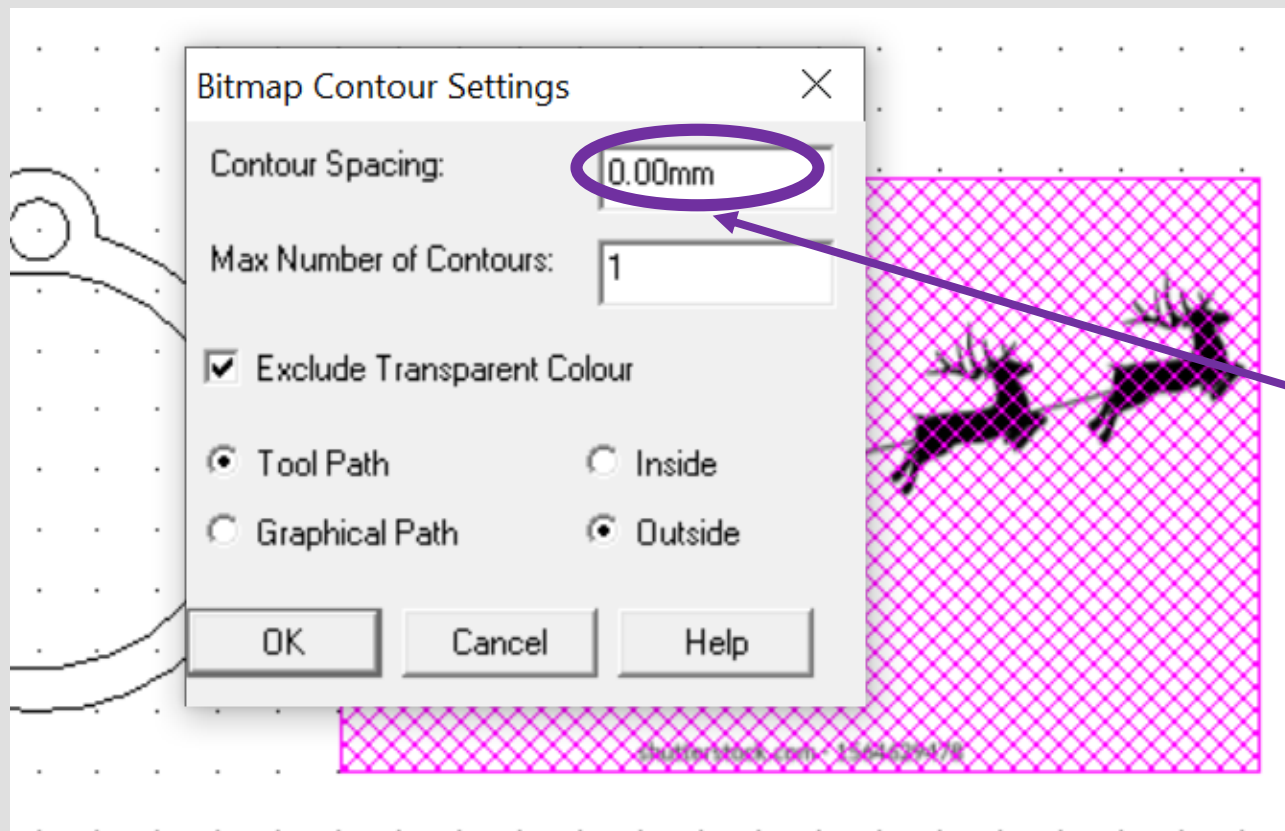
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

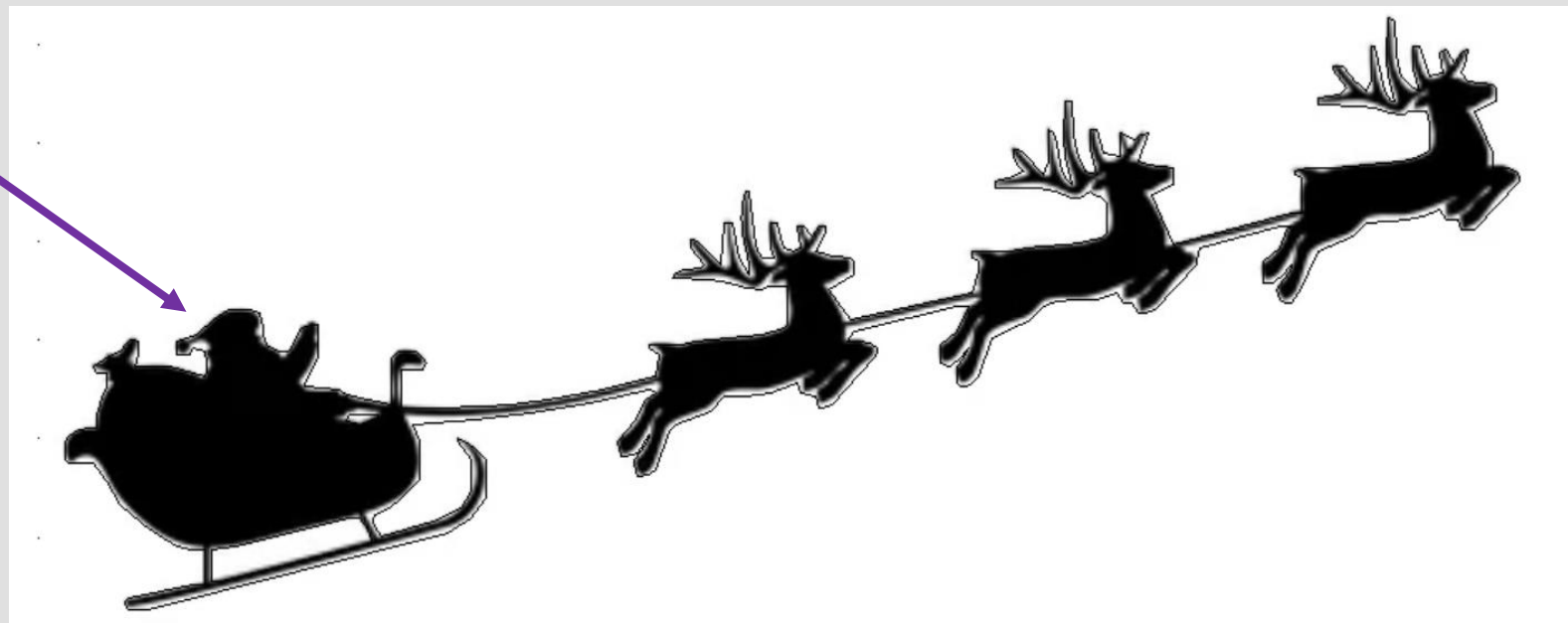
I can connect and apply my knowledge and skills to create ideas and products



20. The **Bitmap Contour** toolbar shown will pop up. Change the *contour spacing* to 0.00



21. **Select** the image and a black outline should appear around the image as if its been *traced*.

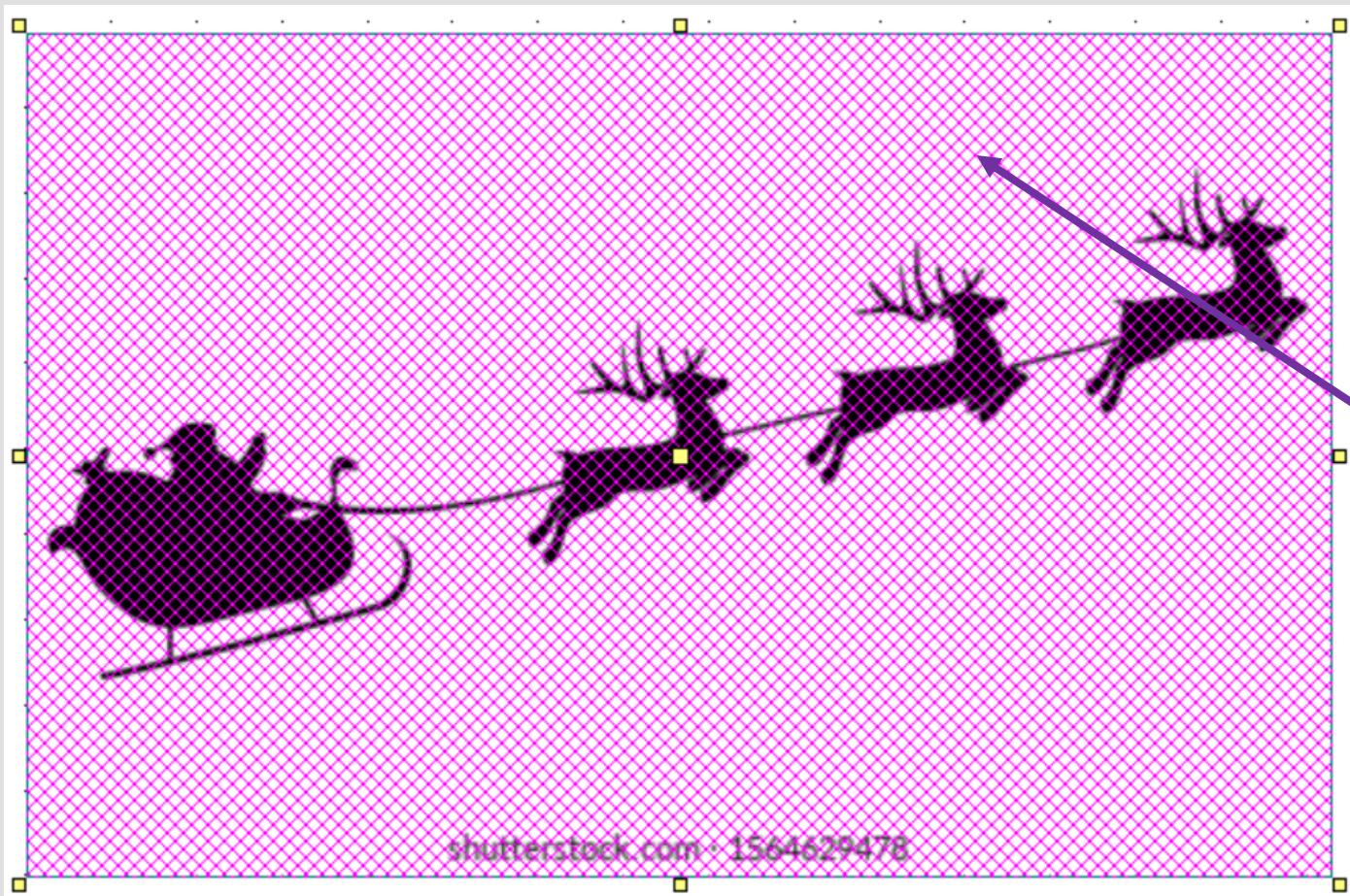


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

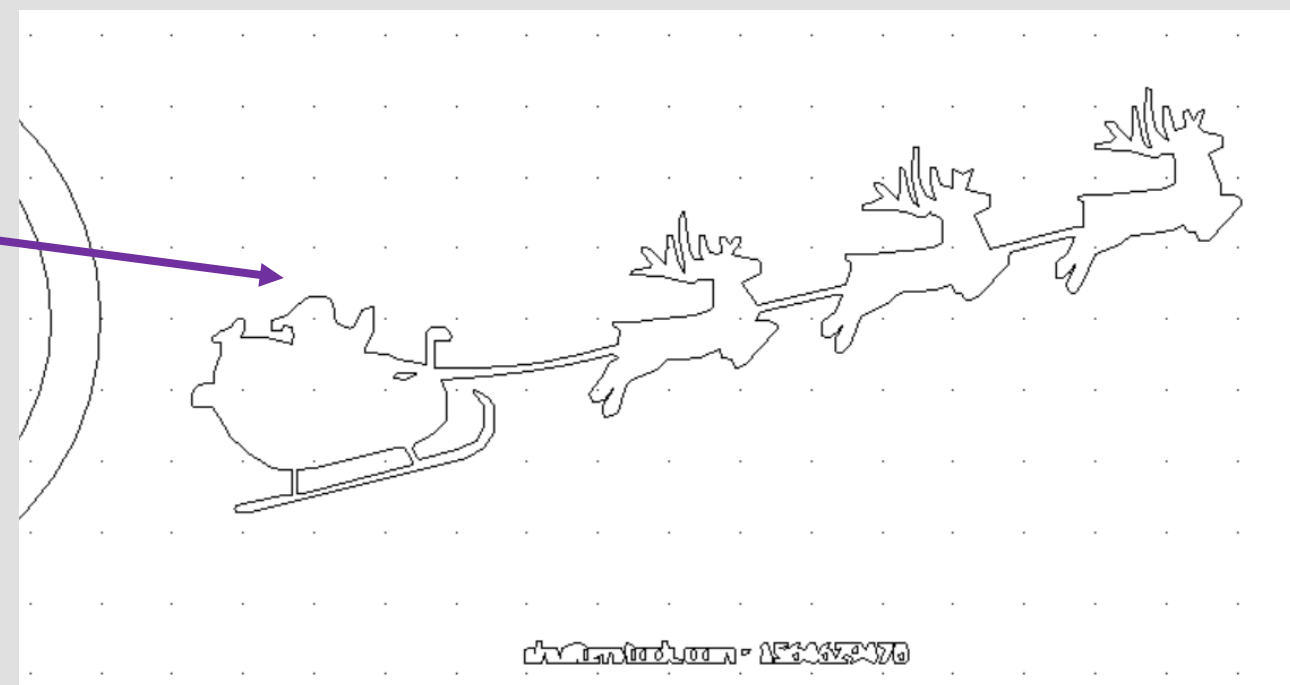


22. Using the ***select tool*** click on the ***actual image*** not the ***contoured traced lines***

Press the ***delete*** button to remove the image



23. You should be left with the ***outline*** of the original image.

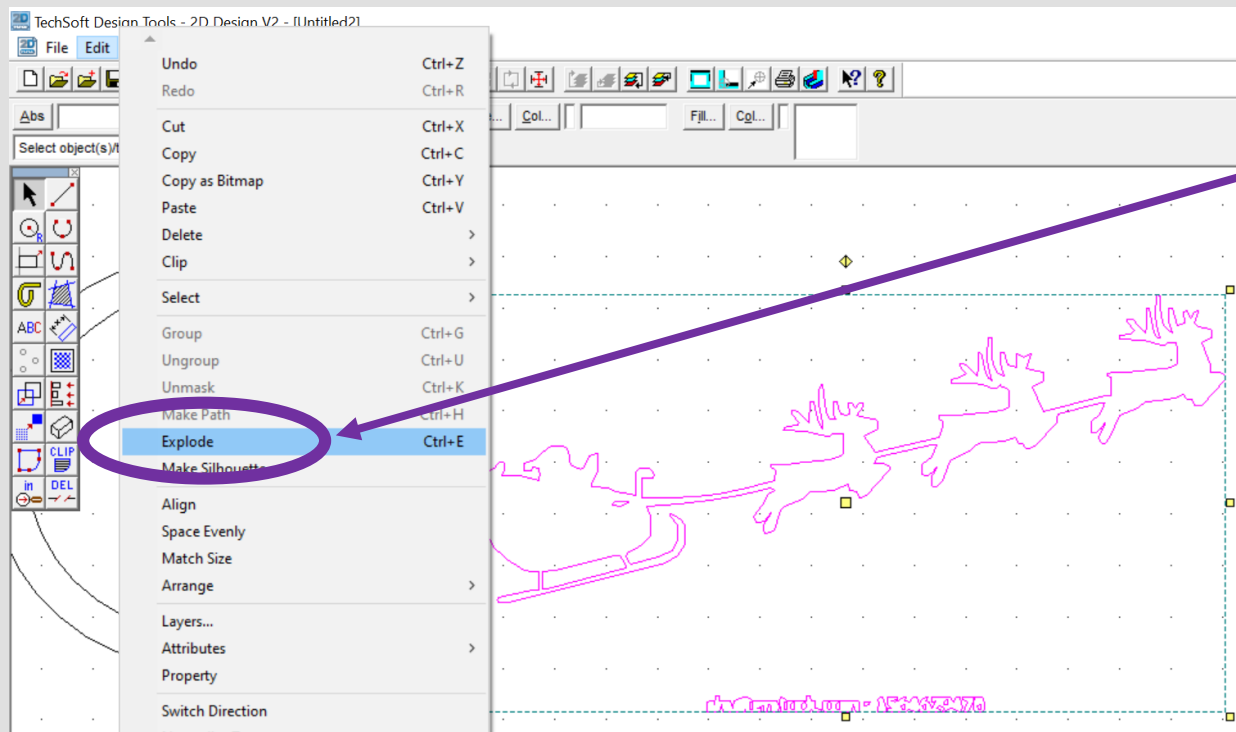


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

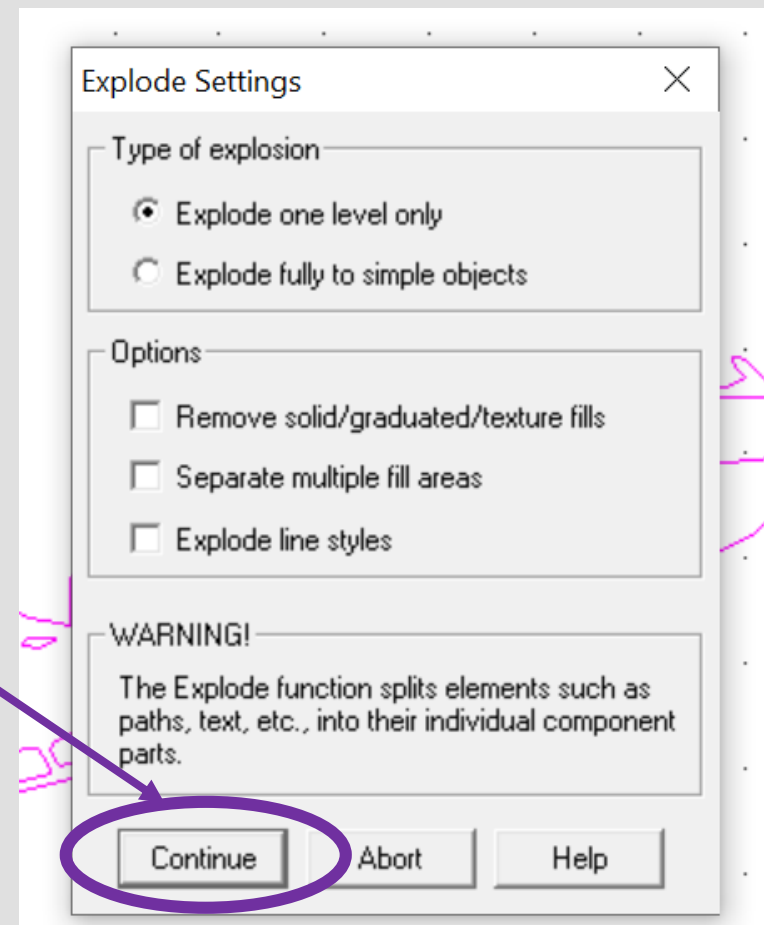
I can connect and apply my knowledge and skills to create ideas and products



24. Using the *select tool*, click on *image* and then the *edit toolbar* at the top. Scroll down to *explode*



25. *The explode settings window should pop up. Press continue.*




Innovation


Digital

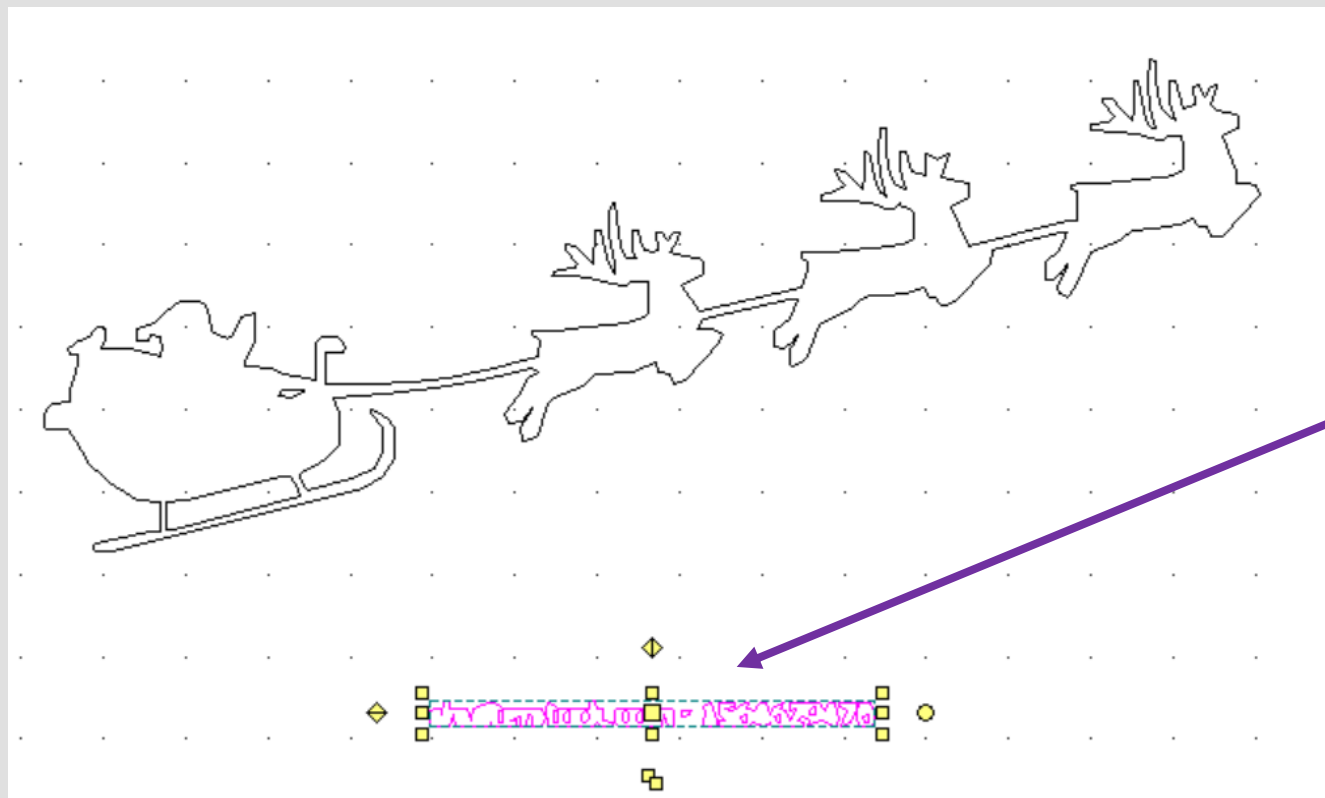

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

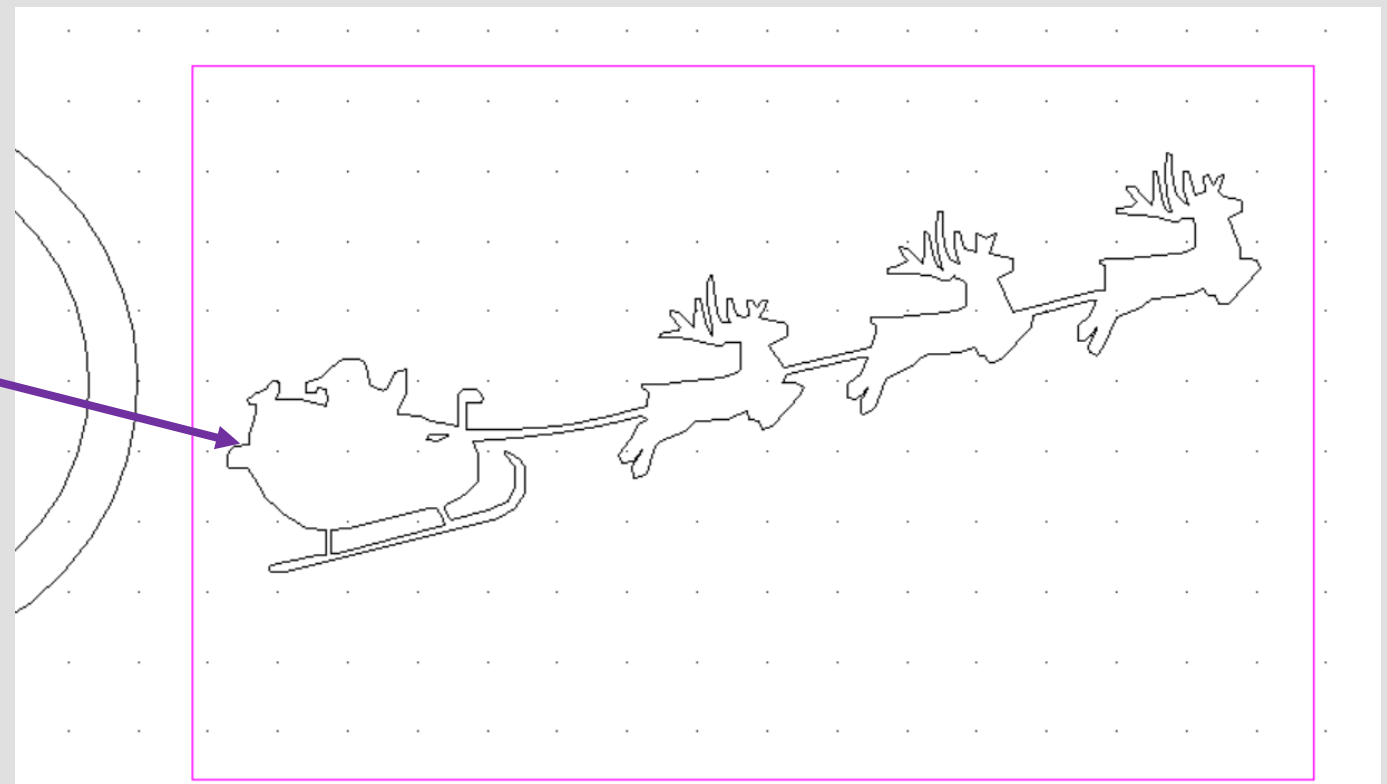
I can connect and apply my knowledge and skills to create ideas and products



26. Using the **select tool**, click on any writing on your image and press **delete** to get rid of it.



27. Using the **select tool**, drag it over the image to highlight it.

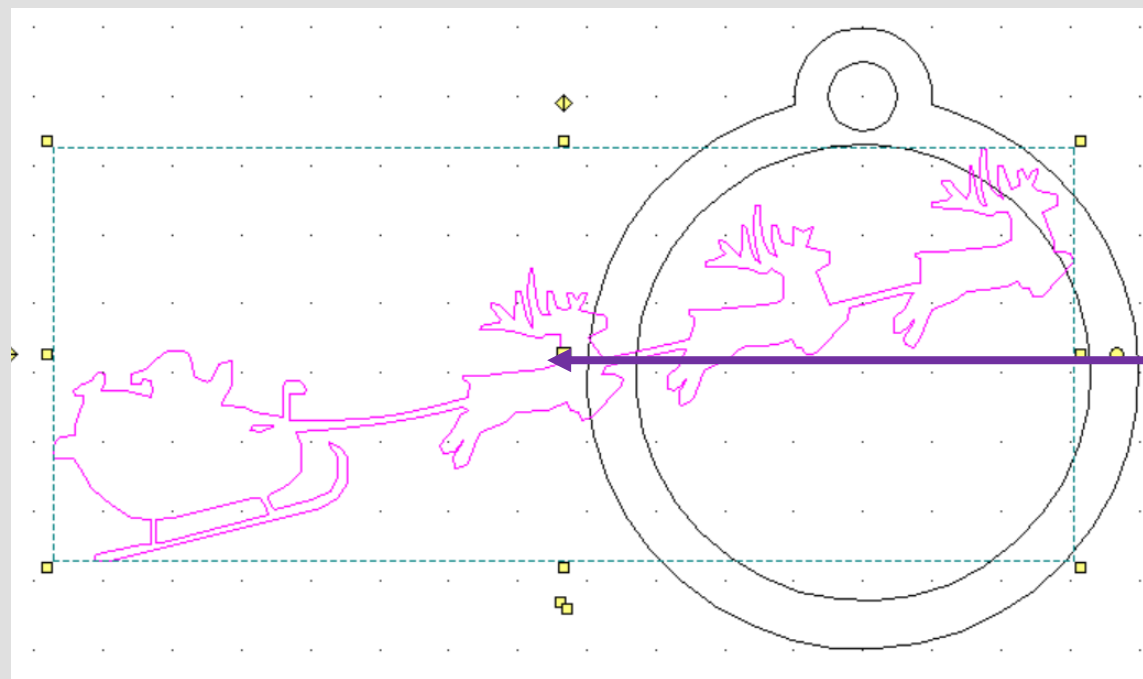


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

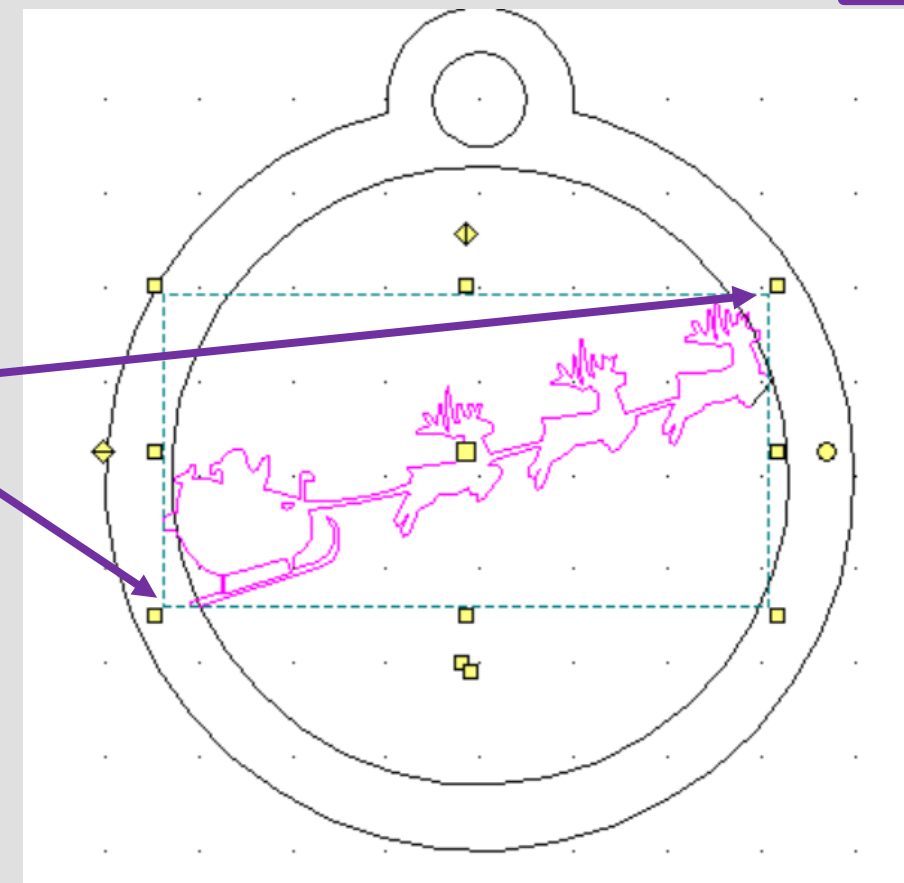
I can connect and apply my knowledge and skills to create ideas and products



28. Then click the *middle square* to move it on to the bauble



29. Using the *select tool*, click on the corner squares to resize so it fits on the bauble

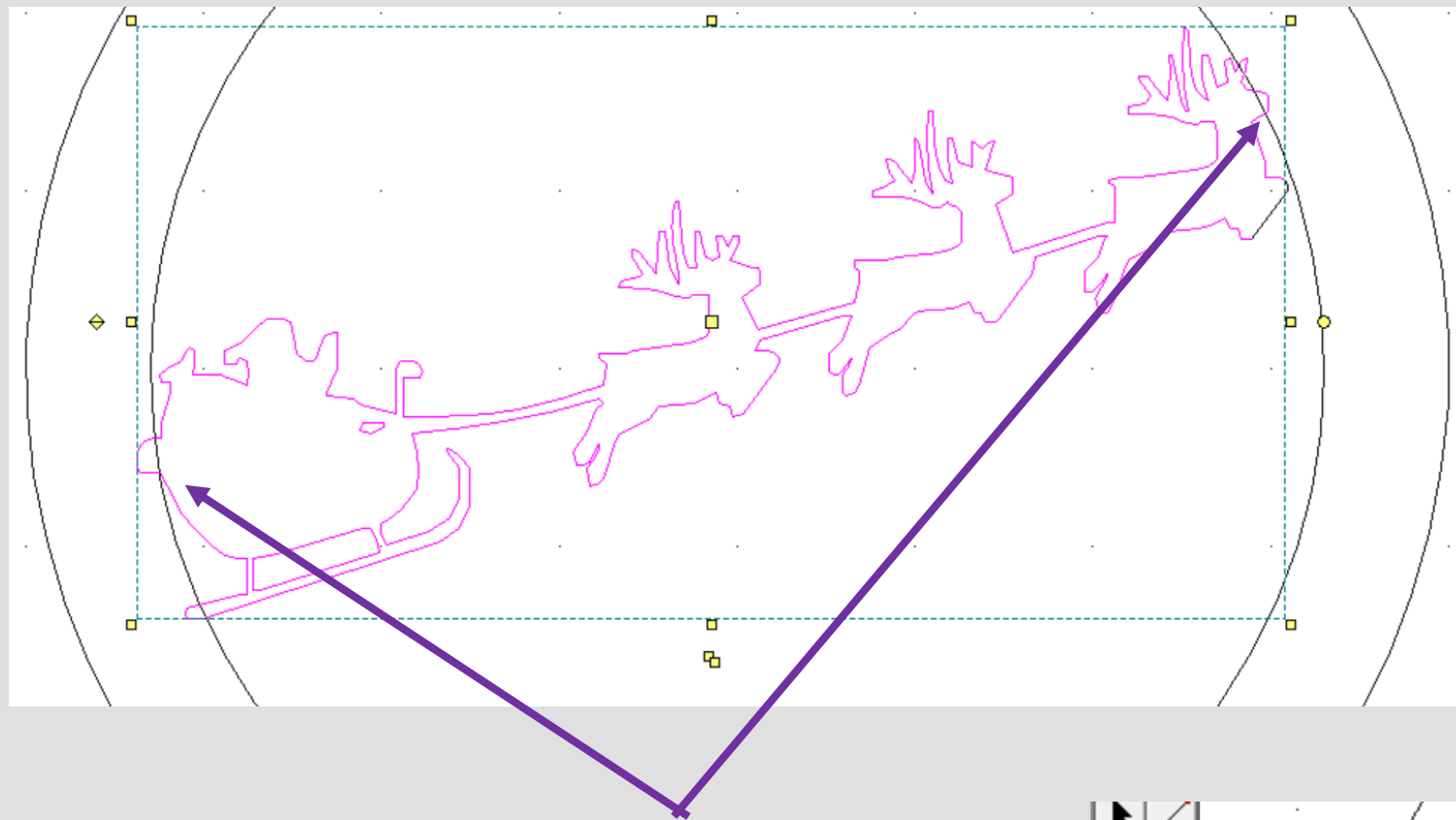
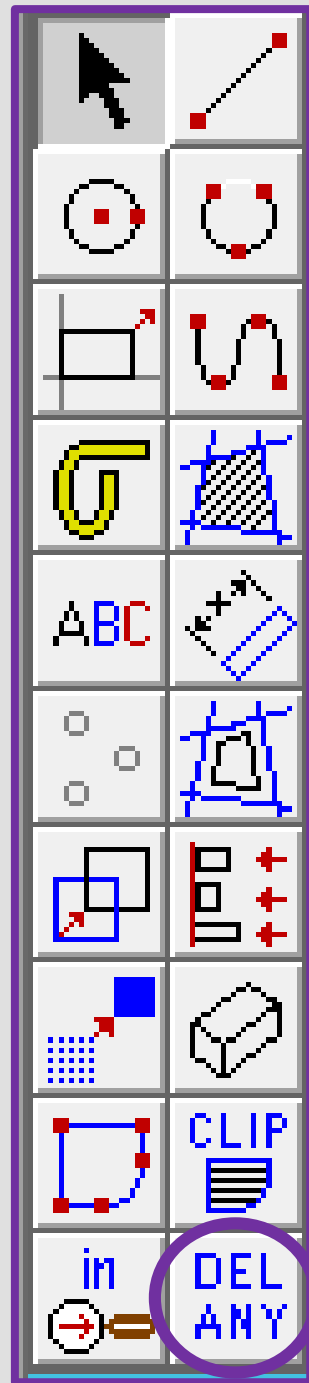


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

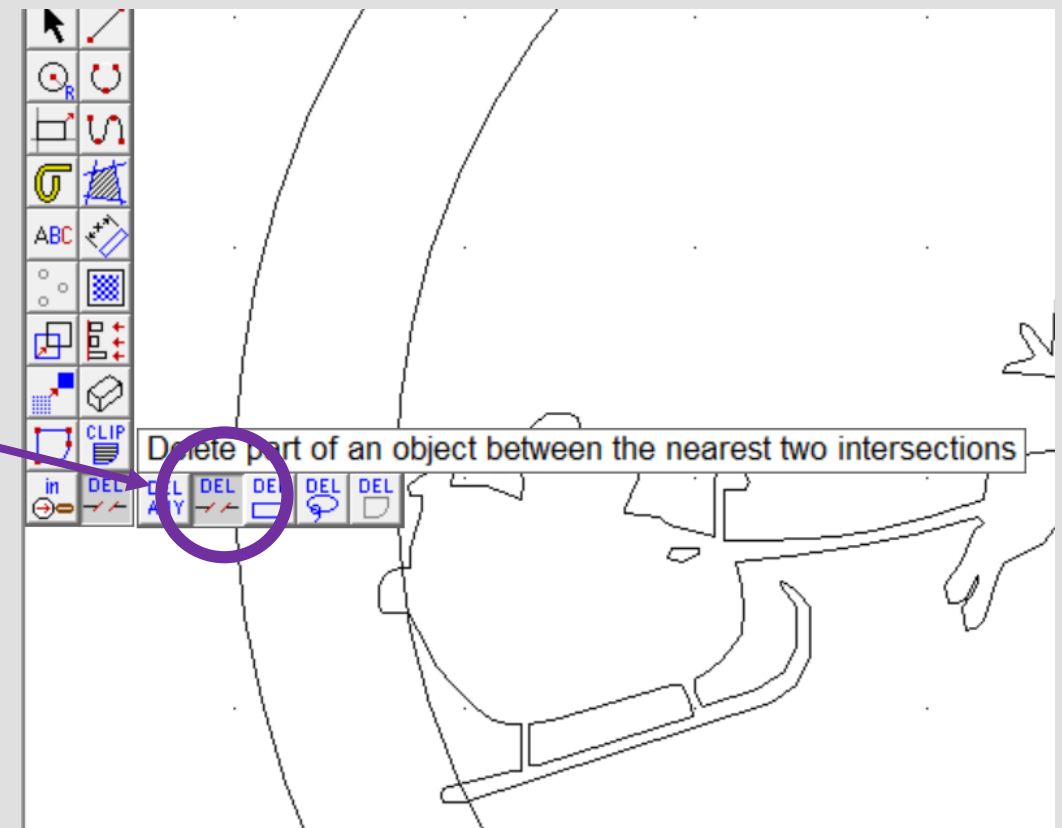
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



30. Using the *select tool*, ensure the image slightly overlaps the inside of the bauble shown above

31. Click and *hold* the *DEL ANY* toolbar down so it *extends* as shown. Click on *DEL PART*.

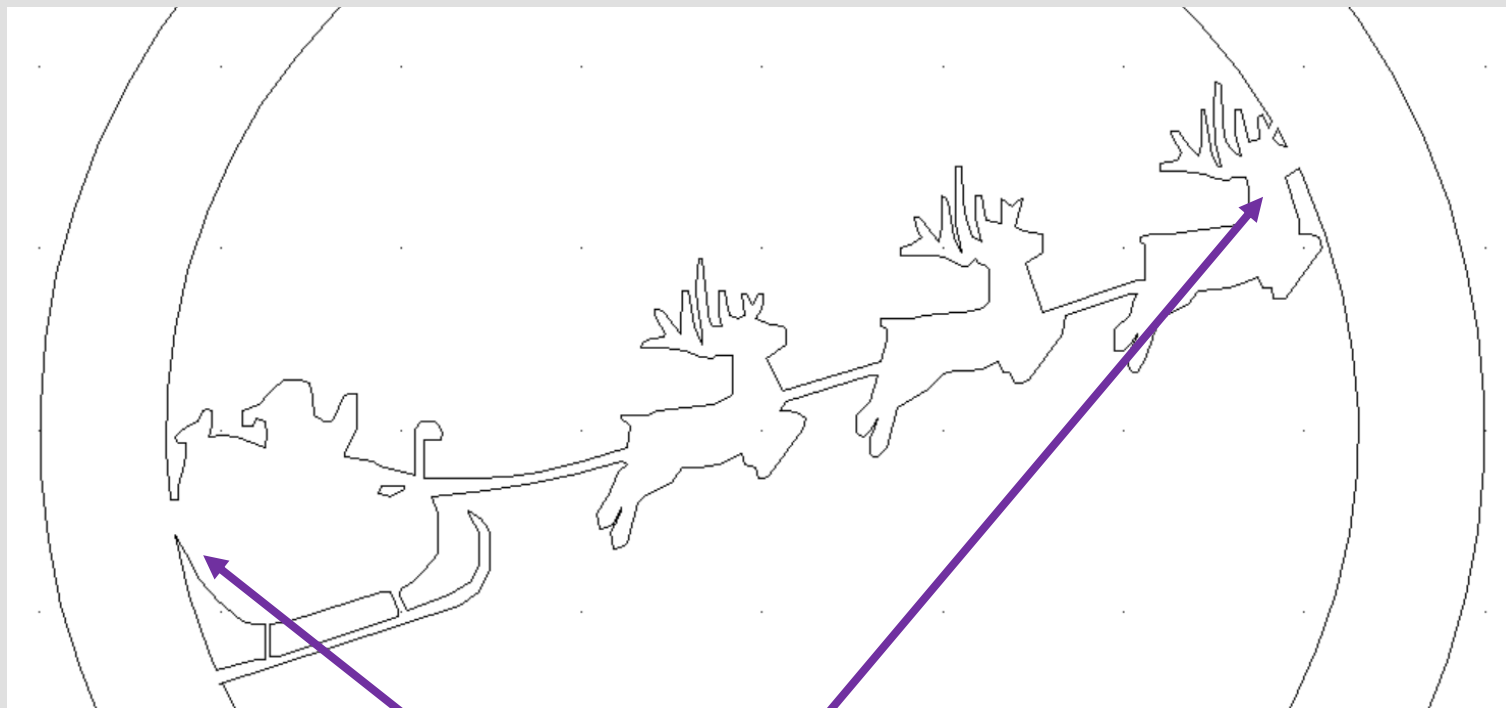


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

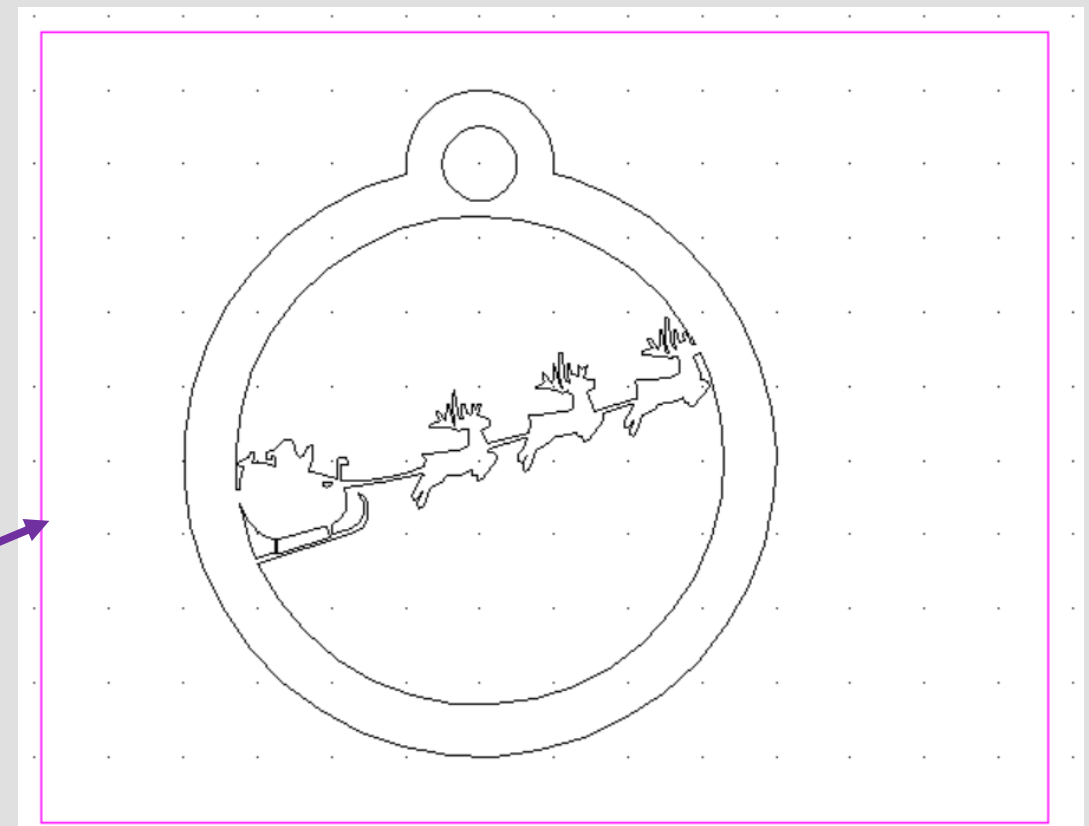
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



32. Using the **DEL PART** tool delete the intersecting lines to make one bauble shape as shown above

33. Using the **select tool**, drag it over the bauble to **select all the parts**.

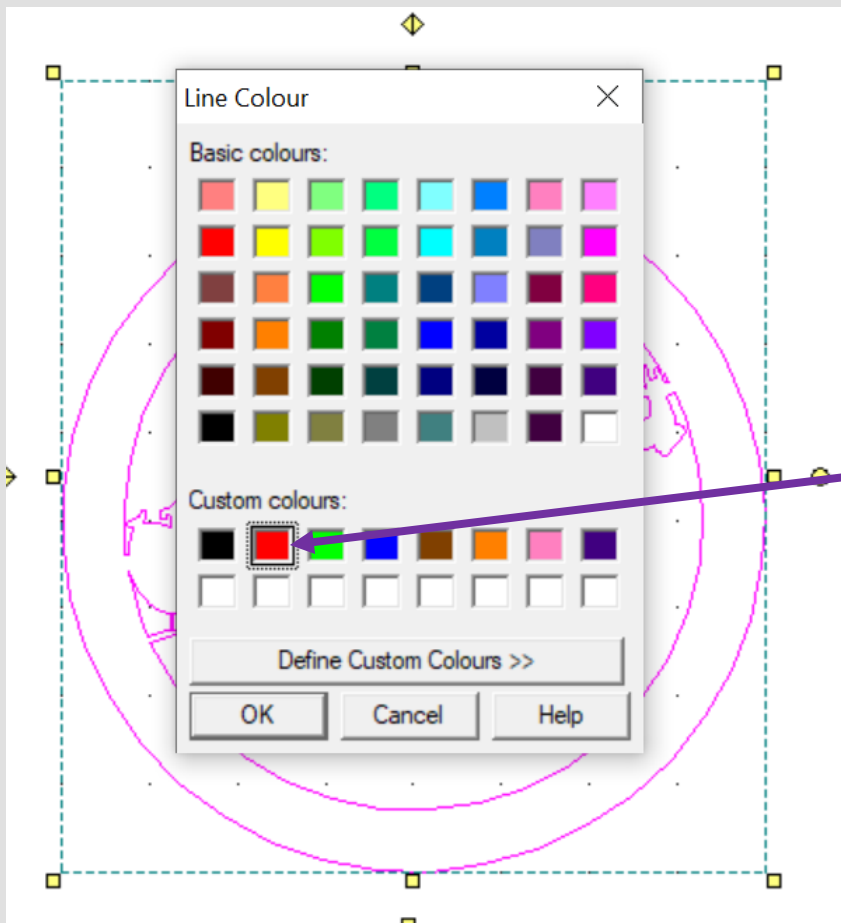


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

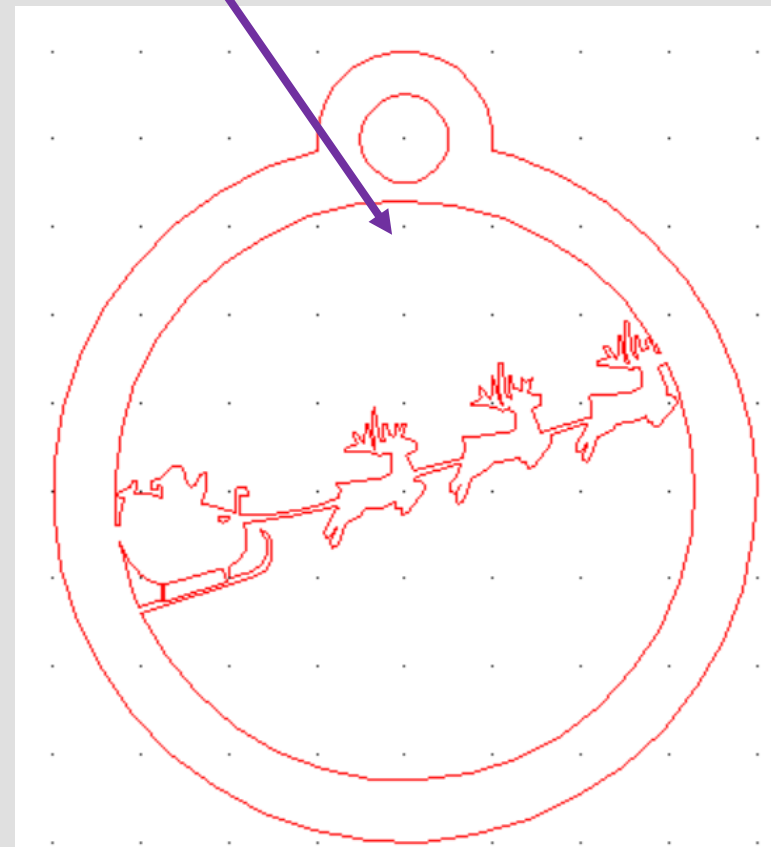
I can connect and apply my knowledge and skills to create ideas and products



34. Using the *select tool*, click on the *line Col button* on the top tool bar.

35. Select the **red colour** from *custom colours*. On the *laser cutter* red is a *cut line*.

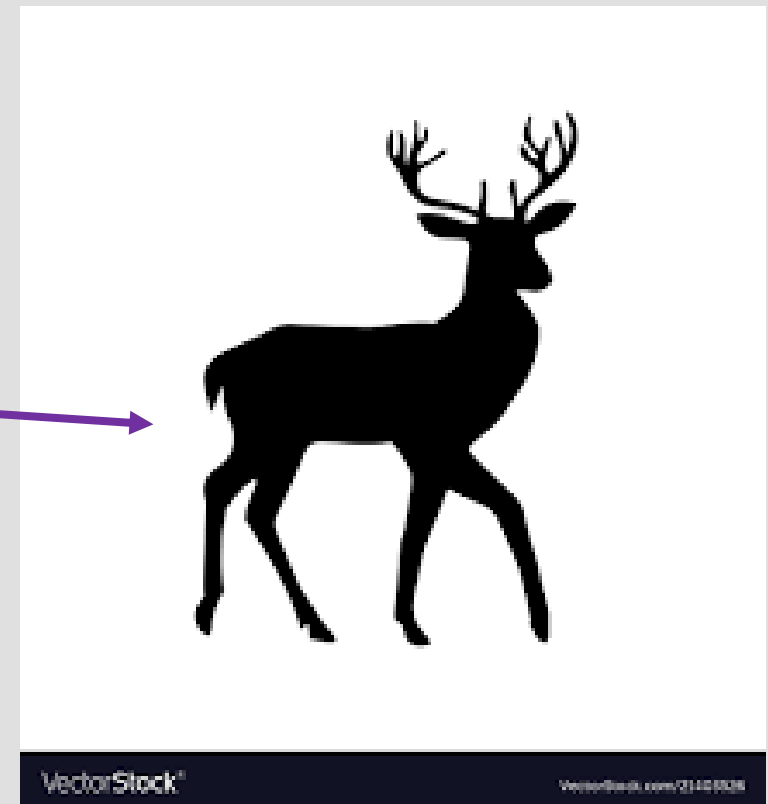
This will turn the outline of the bauble red ready to cut out.





36. Using google chrome search for a **Christmas reindeer silhouette**.

37. Once you have found a image you like. **Right click** and **Copy image**




Innovation


Digital

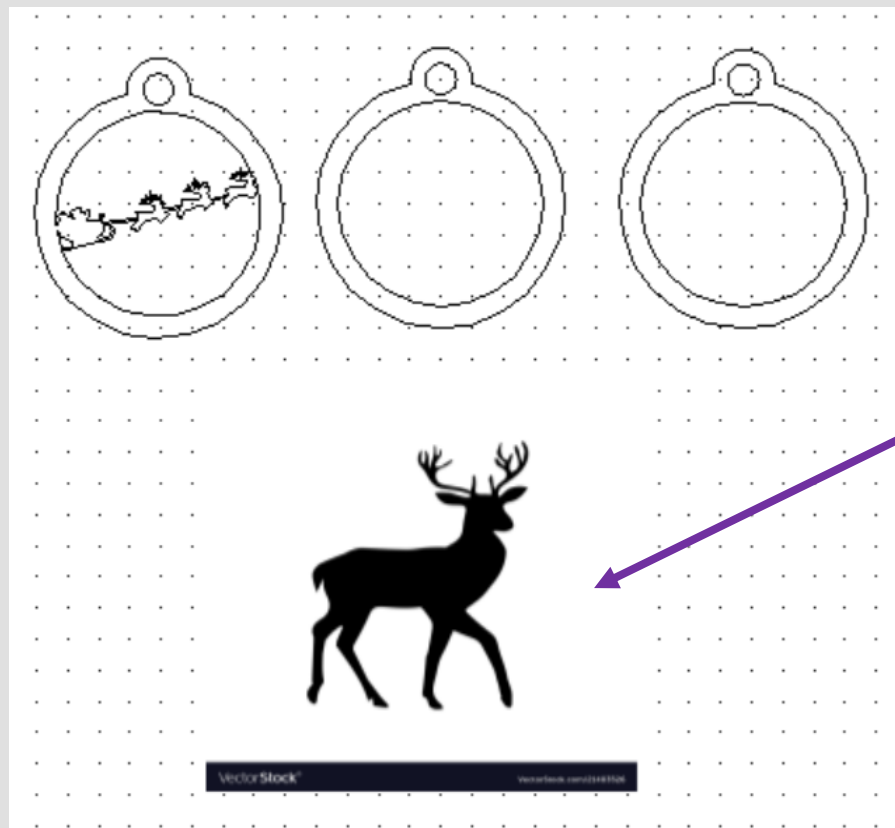

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



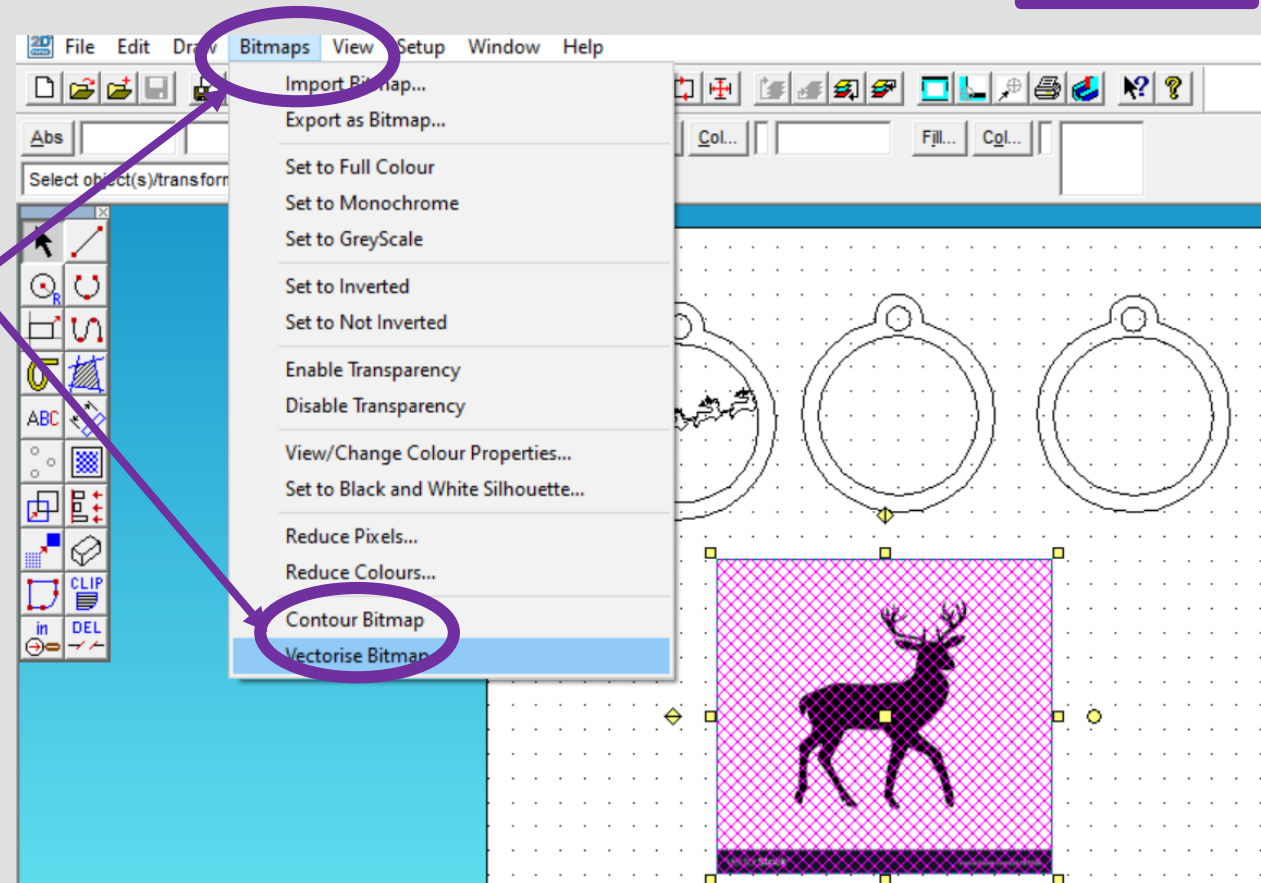
38. In **2D design** *right click* and *select paste* here.



39. **Select** the image and then the **bitmaps toolbar** shown on the top toolbar and in the circle shown opposite. Go down to **contour bitmap**

40. Using the **select tool** click on the **actual image** not the **contoured traced lines** Press the **delete** button to remove the image

41. You should be left with the **outline** of the original image.




Innovation


Digital

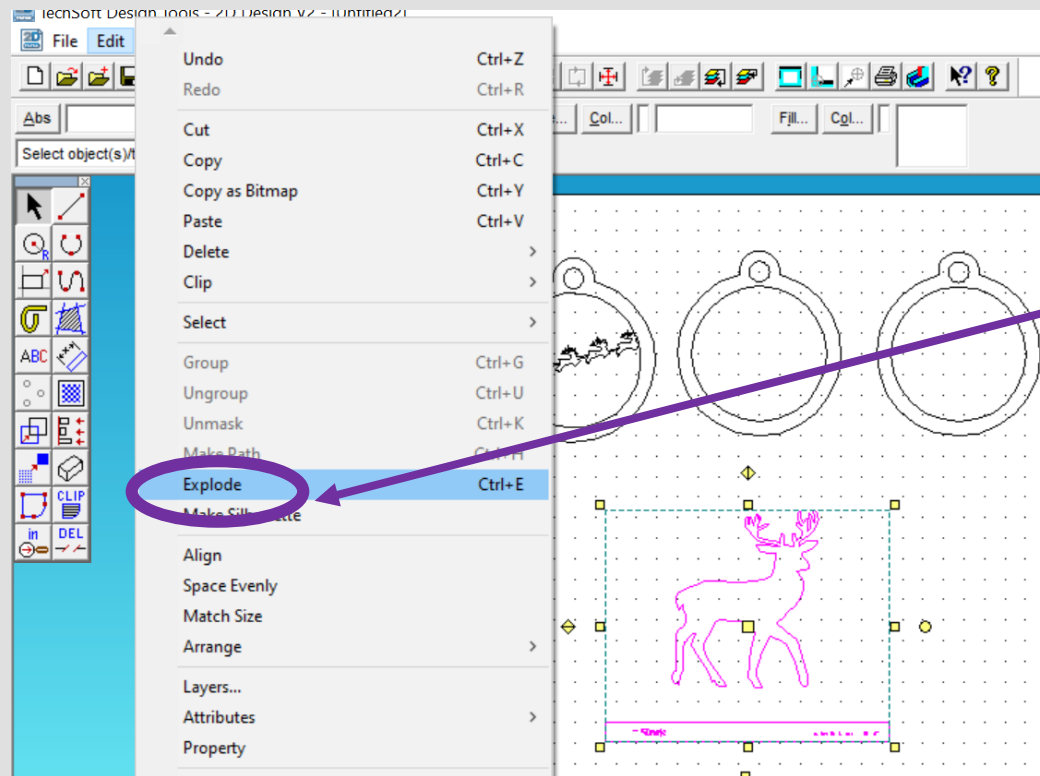

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

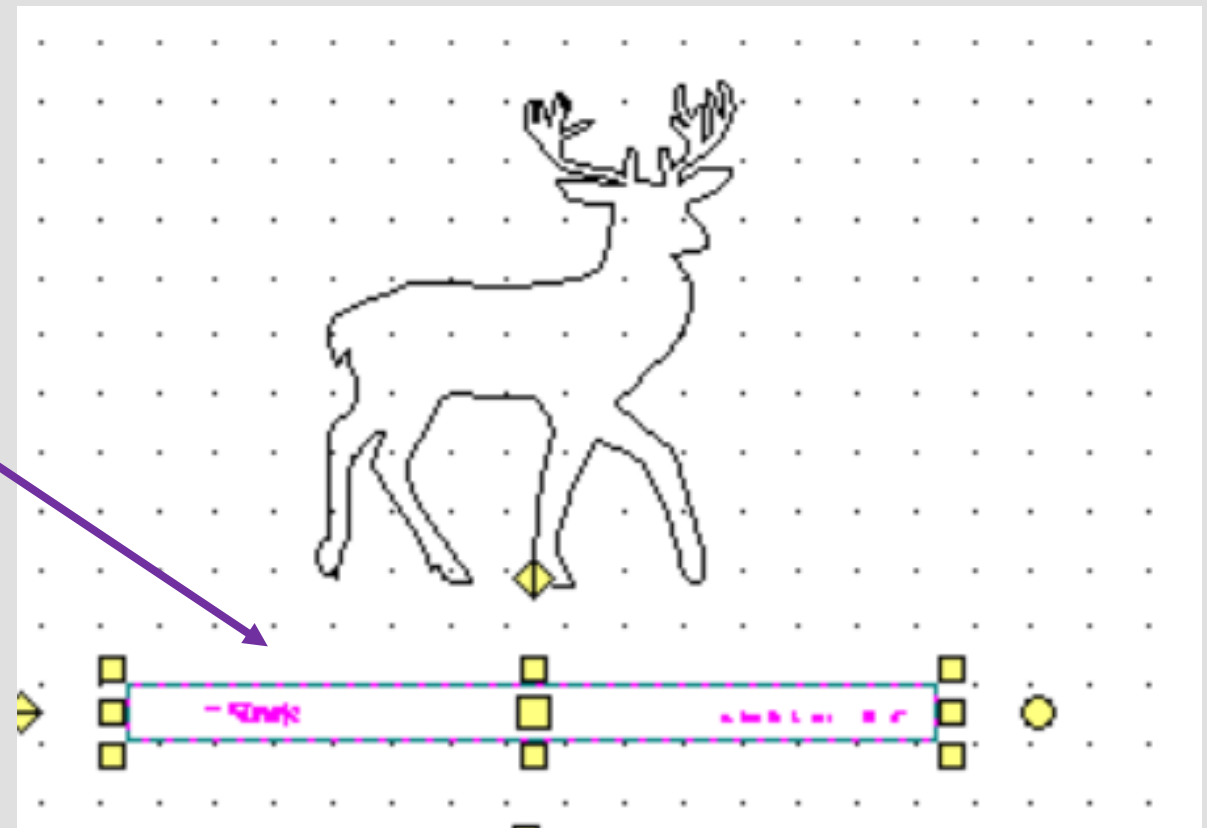
I can connect and apply my knowledge and skills to create ideas and products



42. Using the *select tool*, click on *image* and then the *edit toolbar* at the top. Scroll down to *explode*



43. Using the *select tool*, click on any writing on your image and press *delete* to get rid of it.

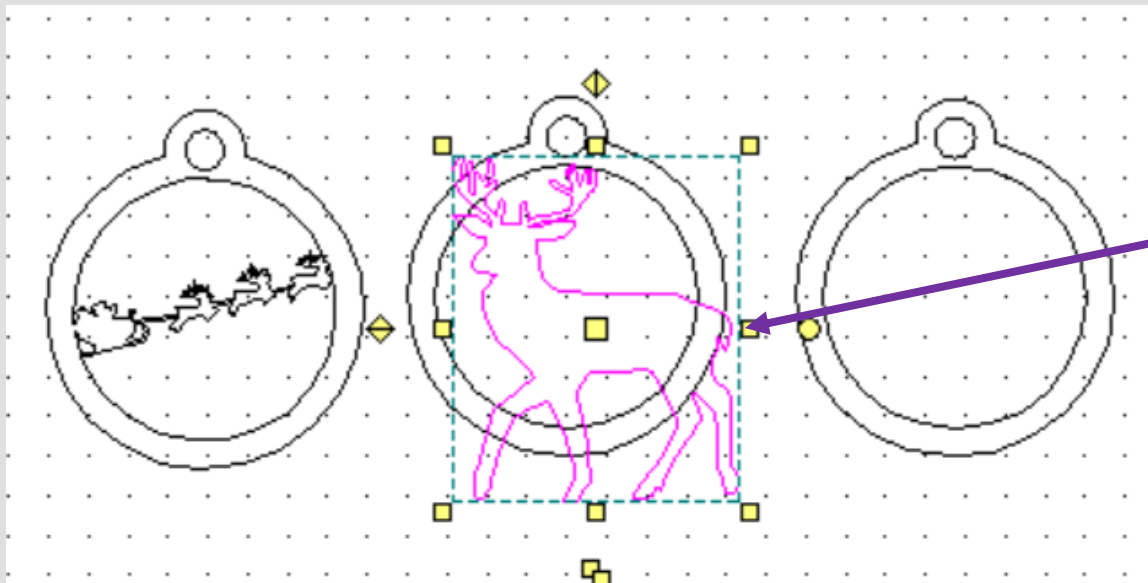


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

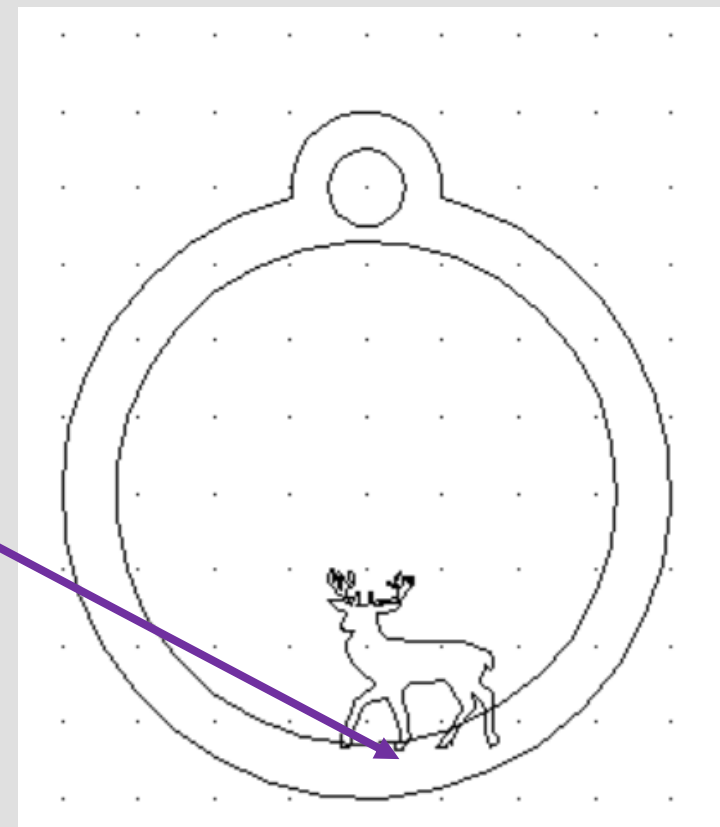
I can connect and apply my knowledge and skills to create ideas and products



44. Then click the **middle square** to move it on to the bauble



45. Using the **select tool**, click on the corner squares to resize so it fits on the bauble. Remember this is going in front of the father Christmas and reindeer so needs to be quite small

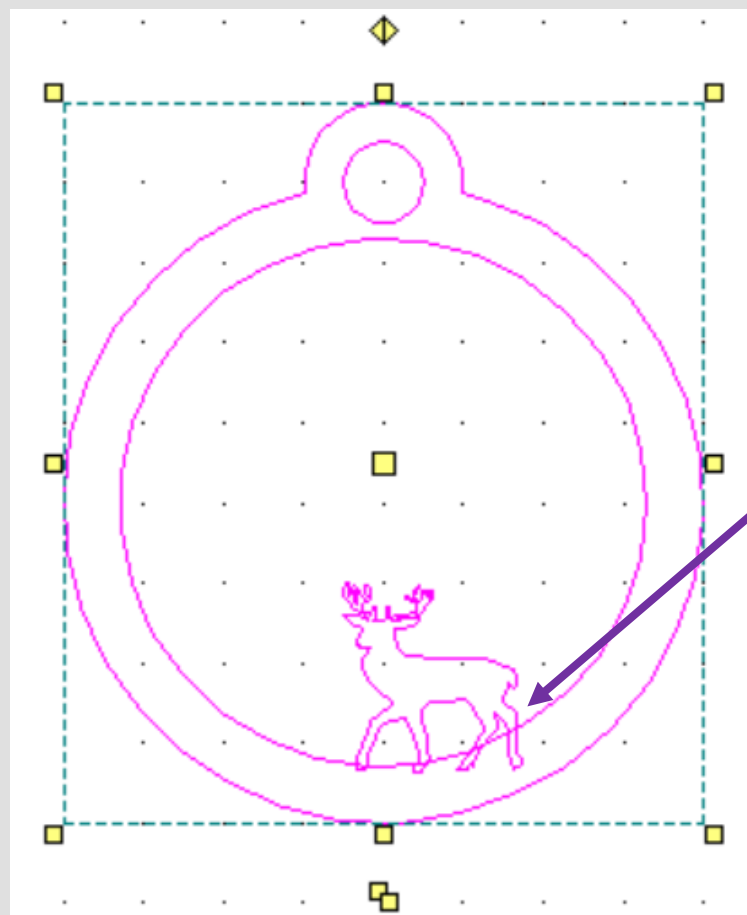


Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

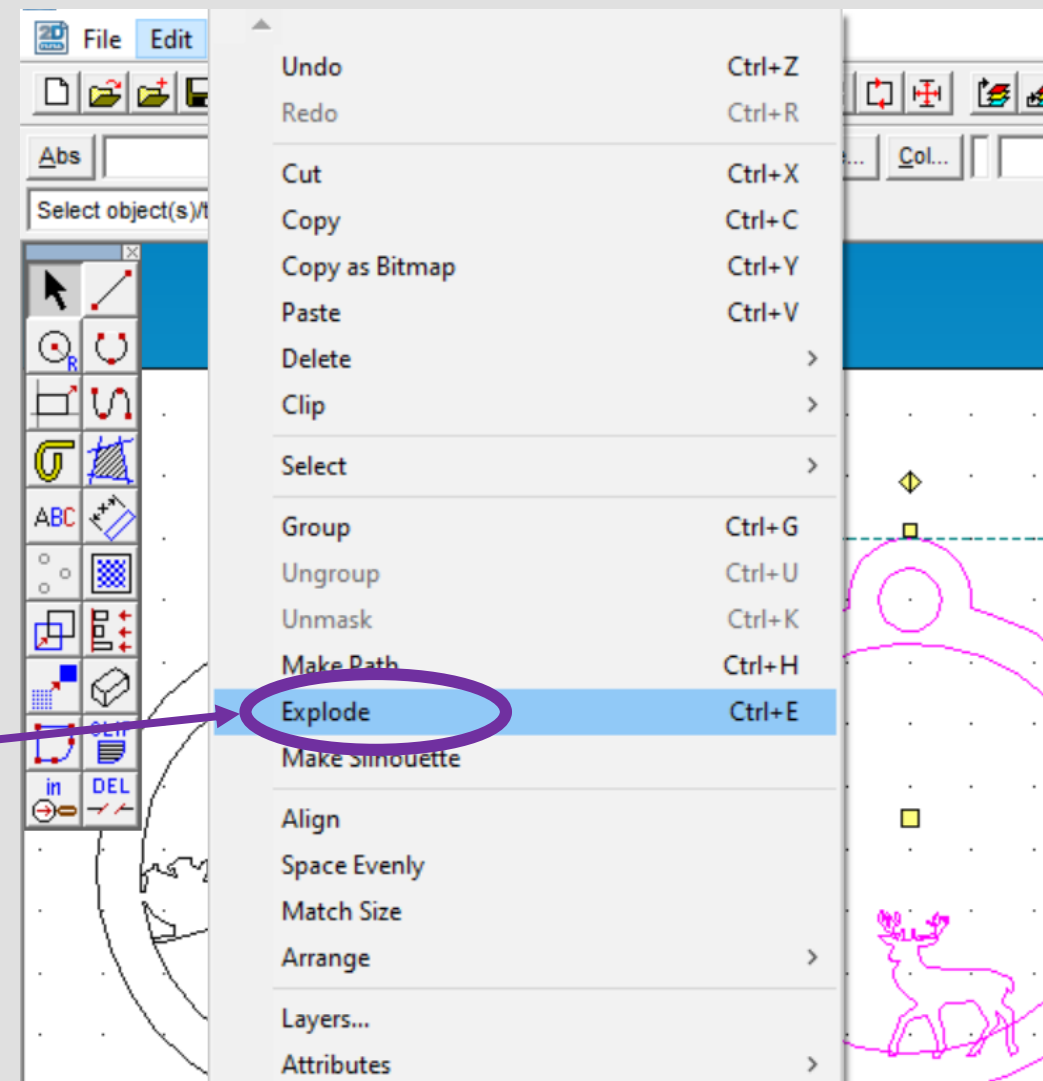
I can connect and apply my knowledge and skills to create ideas and products

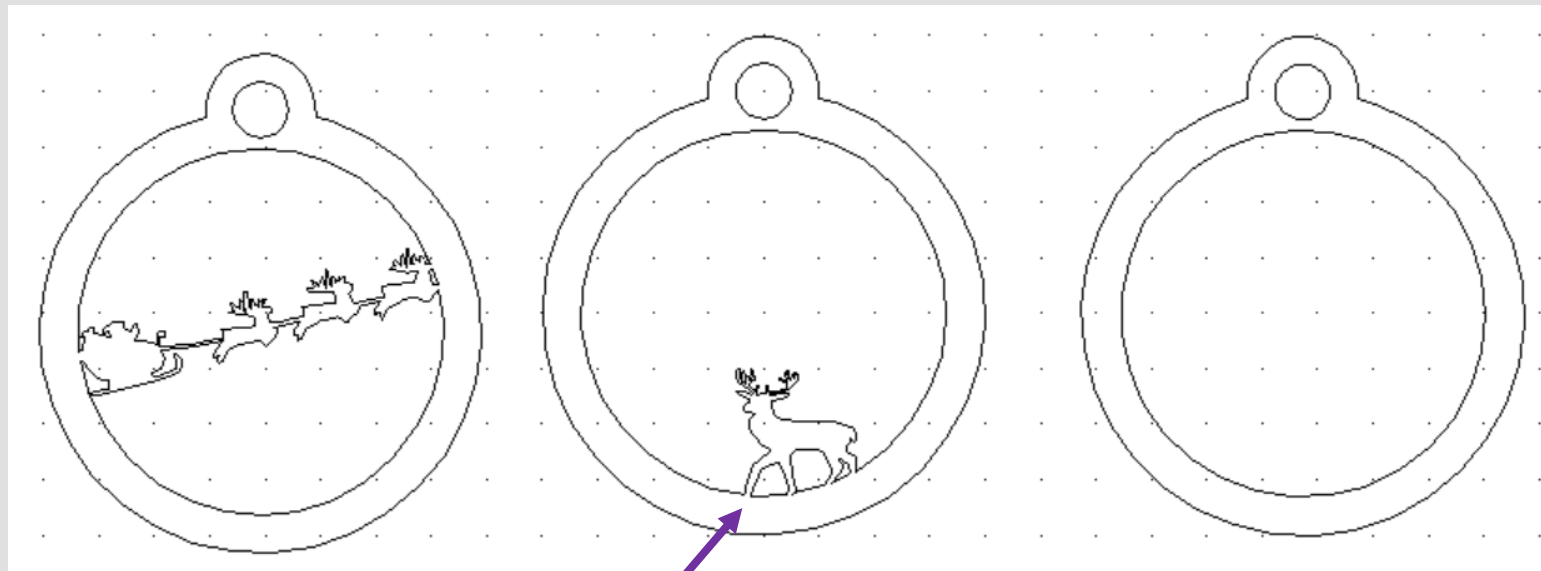


46. Using the *select tool*, drag it over the bauble to highlight it.



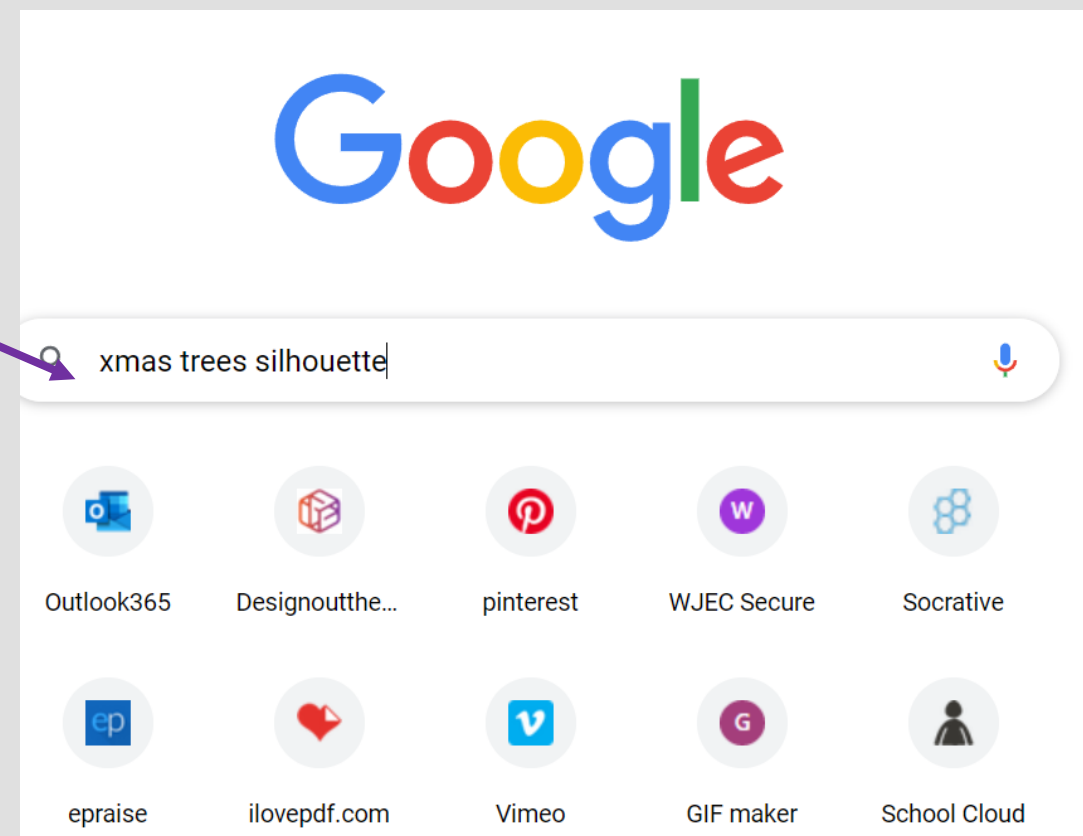
47. Using the *select tool*, click on *image* and then the *edit toolbar* at the top. Scroll down to *explode*





48. Using the **DEL PART** tool delete the intersecting lines to make one bauble shape as shown above

49. Using google chrome search for a **Christmas tree silhouette**.




Innovation


Digital

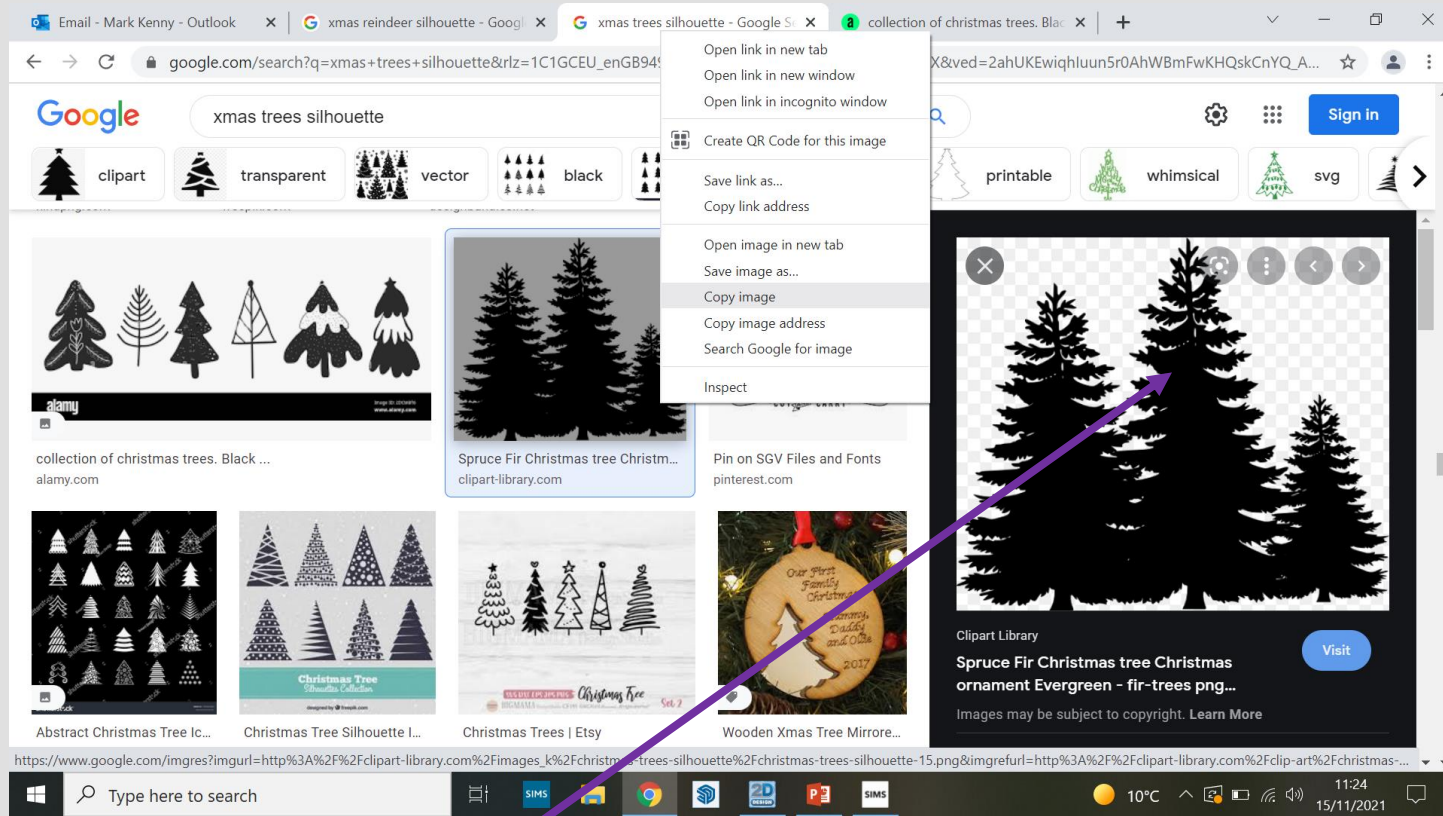

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

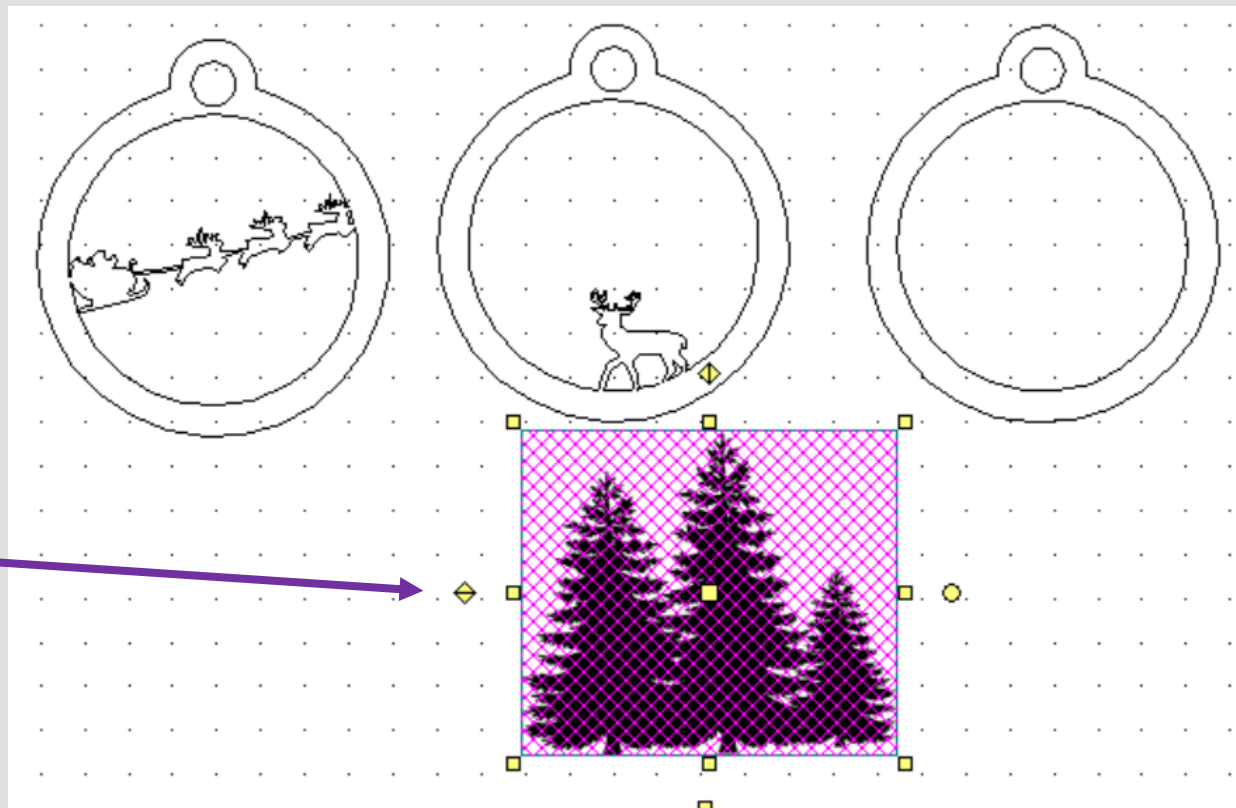
Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



50. Once you have found a image you like. **Right click** and **Copy image**

51. In **2D design** **right click** and **select paste** here.




Innovation


Digital

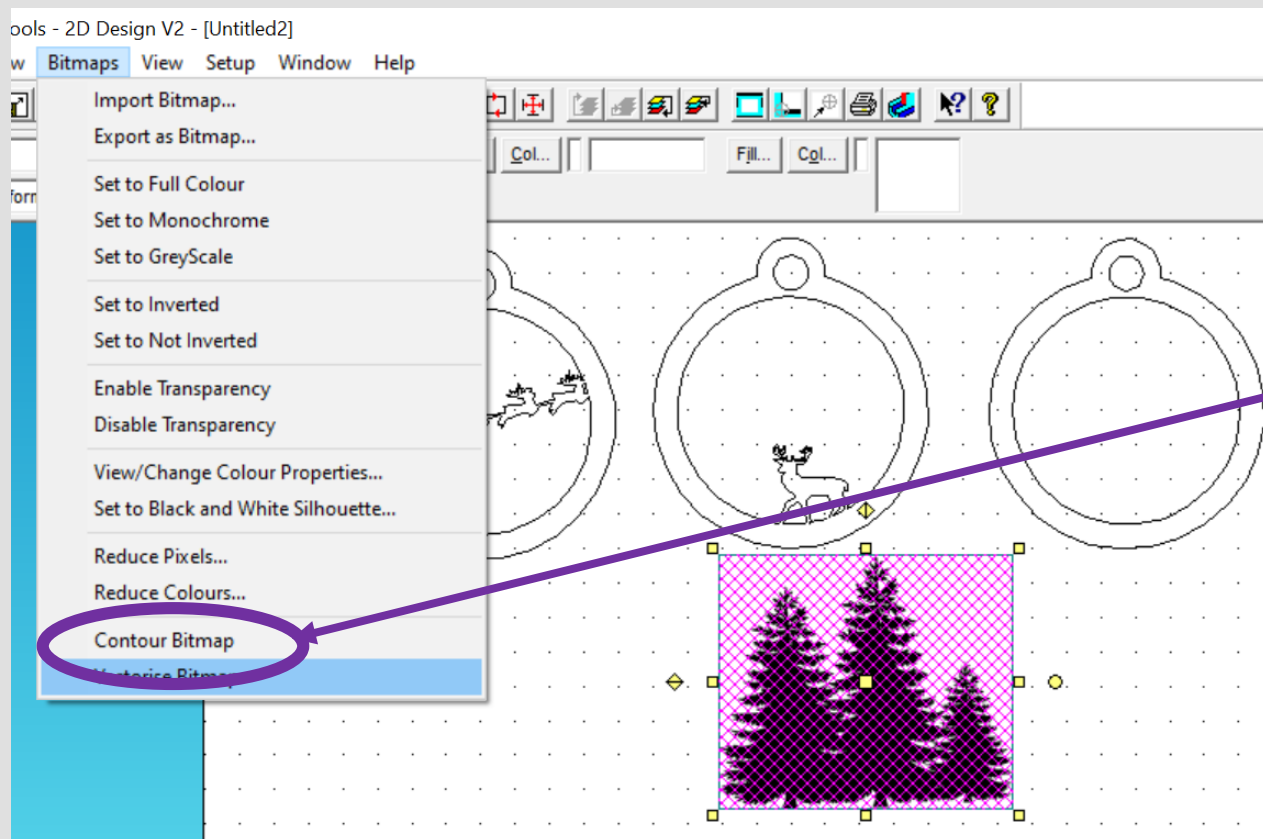

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

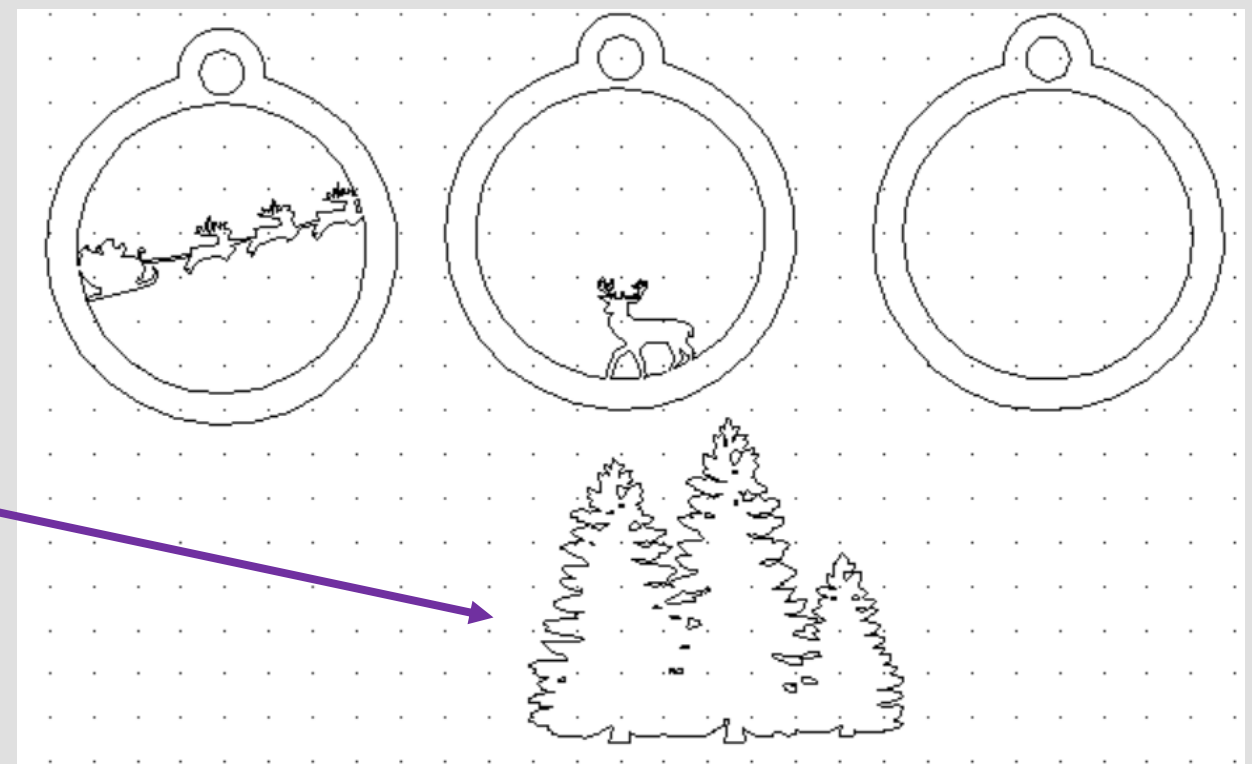


52. **Select** the image and then the **bitmaps toolbar** shown on the top toolbar and in the circle shown opposite. Go down to **contour bitmap**



53. Using the **select tool** click on the **actual image** not the **contoured traced lines** Press the **delete** button to remove the image

54. You should be left with the **outline** of the original image.




Innovation


Digital

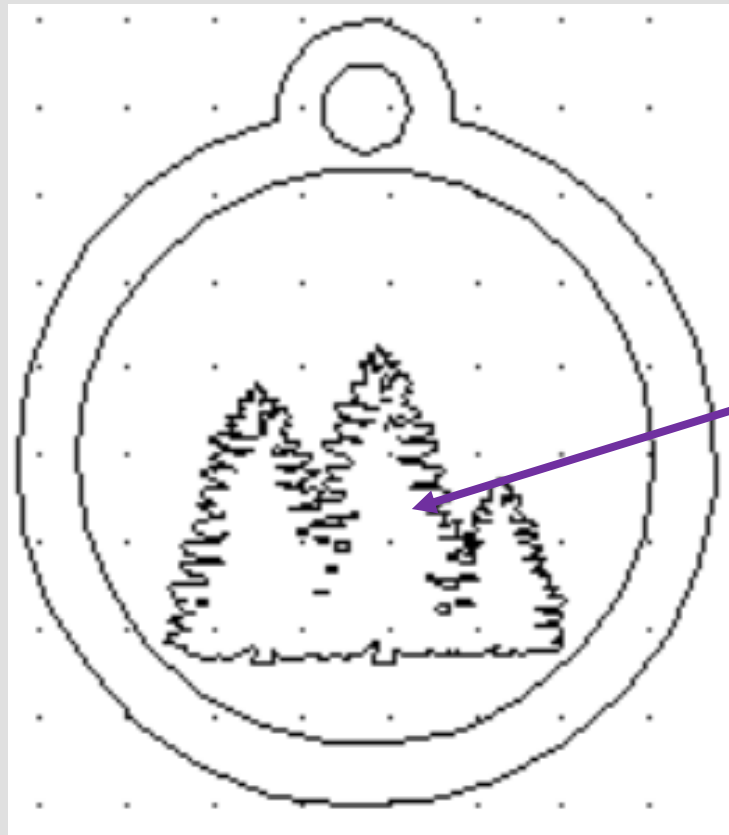
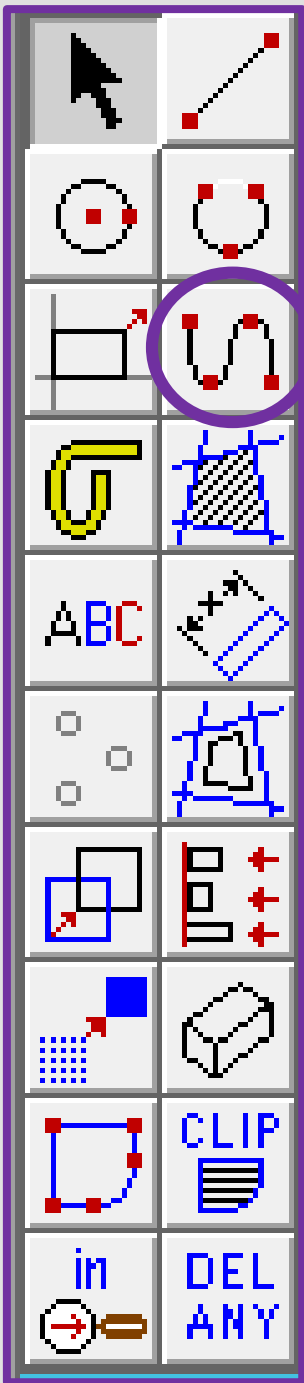

Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

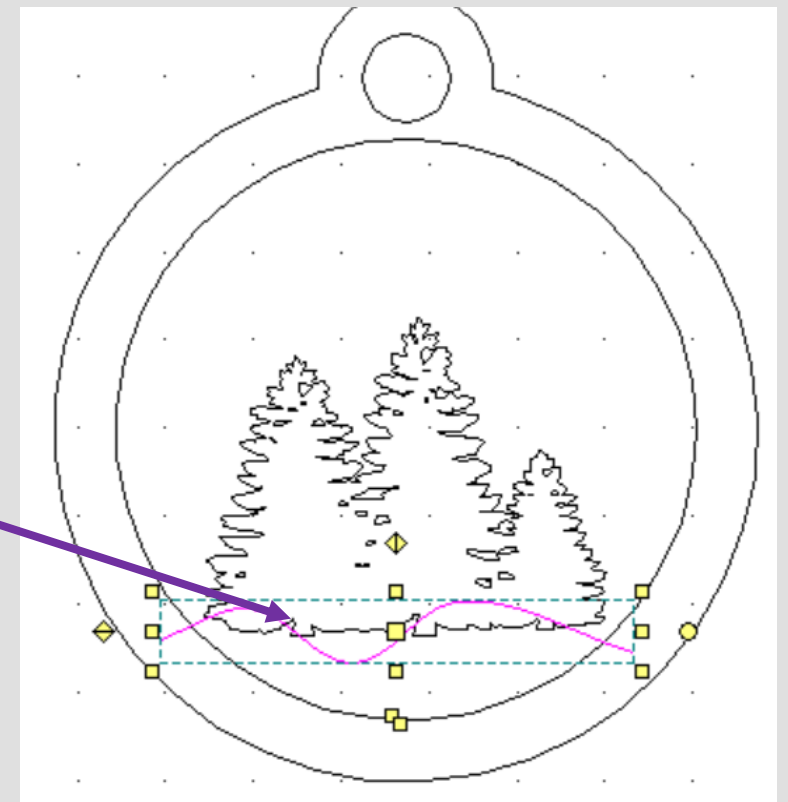


55. Then click the *middle square* to move it on to the bauble and resize it.

Remember this goes behind the deer and father Christmas should be flying over the trees



56. In the case of this tree it *does not overlap* the inside bauble. Use the *line tool* to draw a hill to *attach (overlap)* the bauble and the tree.



Innovation



Digital



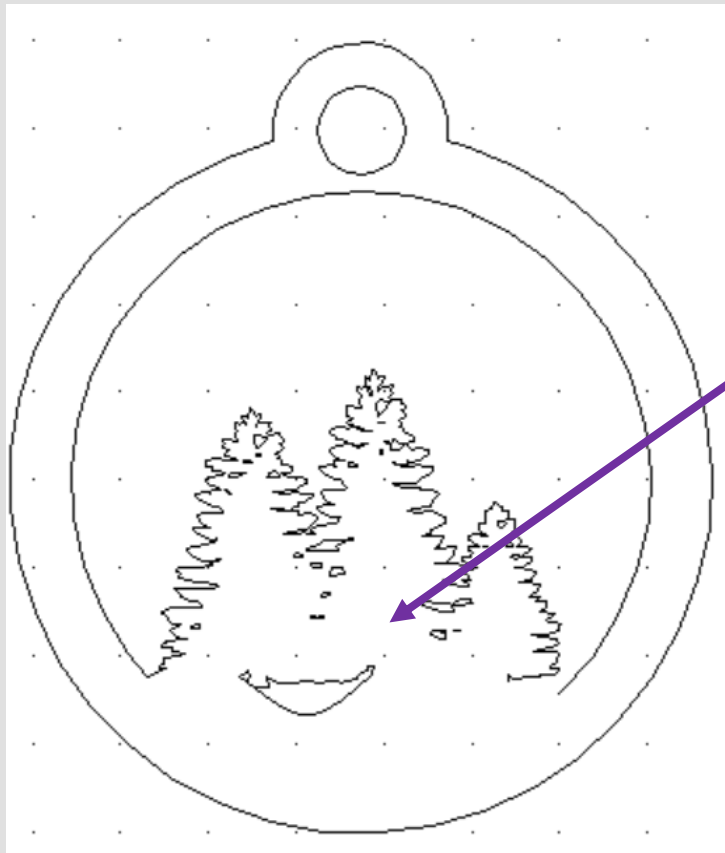
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

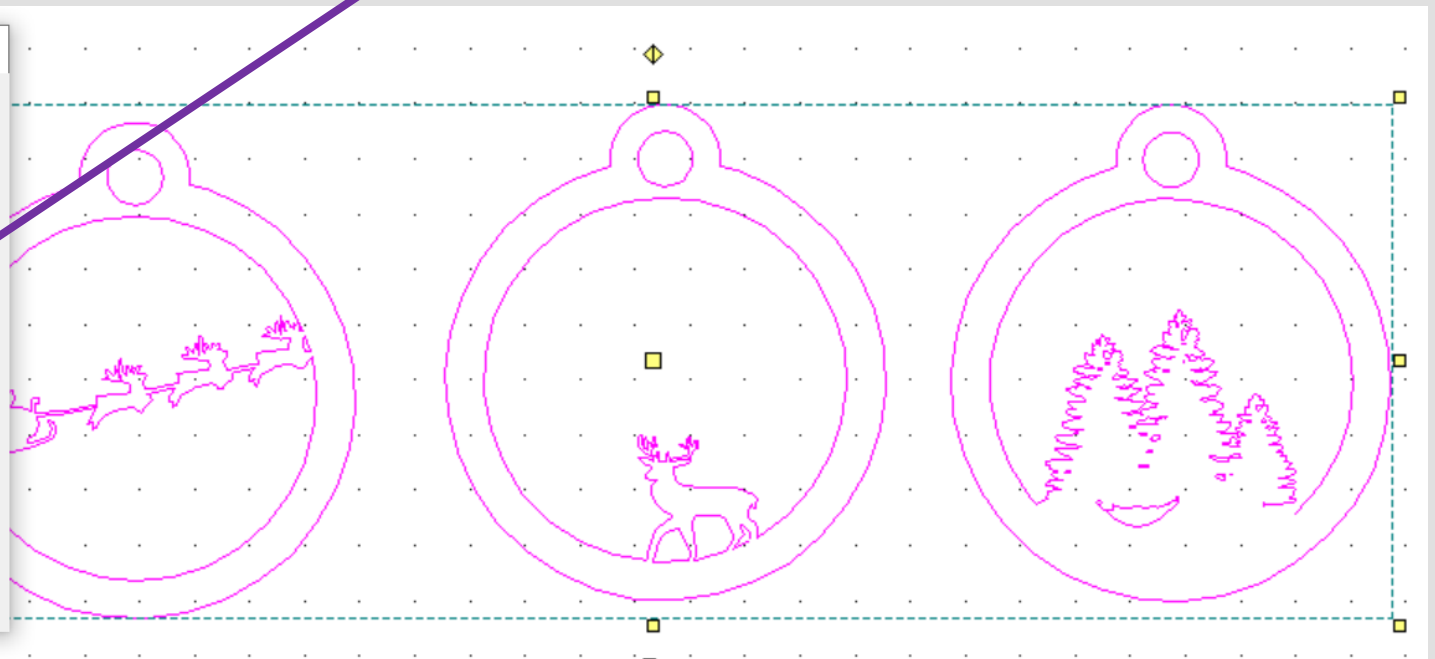
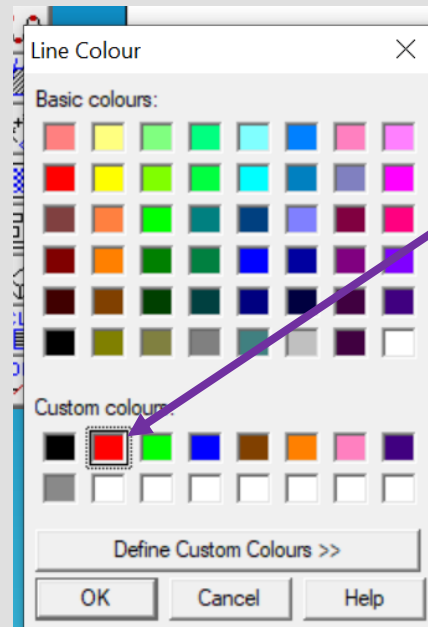


57. Using the **DEL PART** tool delete the intersecting lines to make one bauble shape as shown opposite.

Remember you may need to explode if it does not delete properly.

58. Select all the baubles. Using the **select tool**, click on the **line Col button** on the top tool bar.

59. Select the **red colour** from **custom colours**. On the **laser cutter** red is a **cut line**.



Innovation



Digital



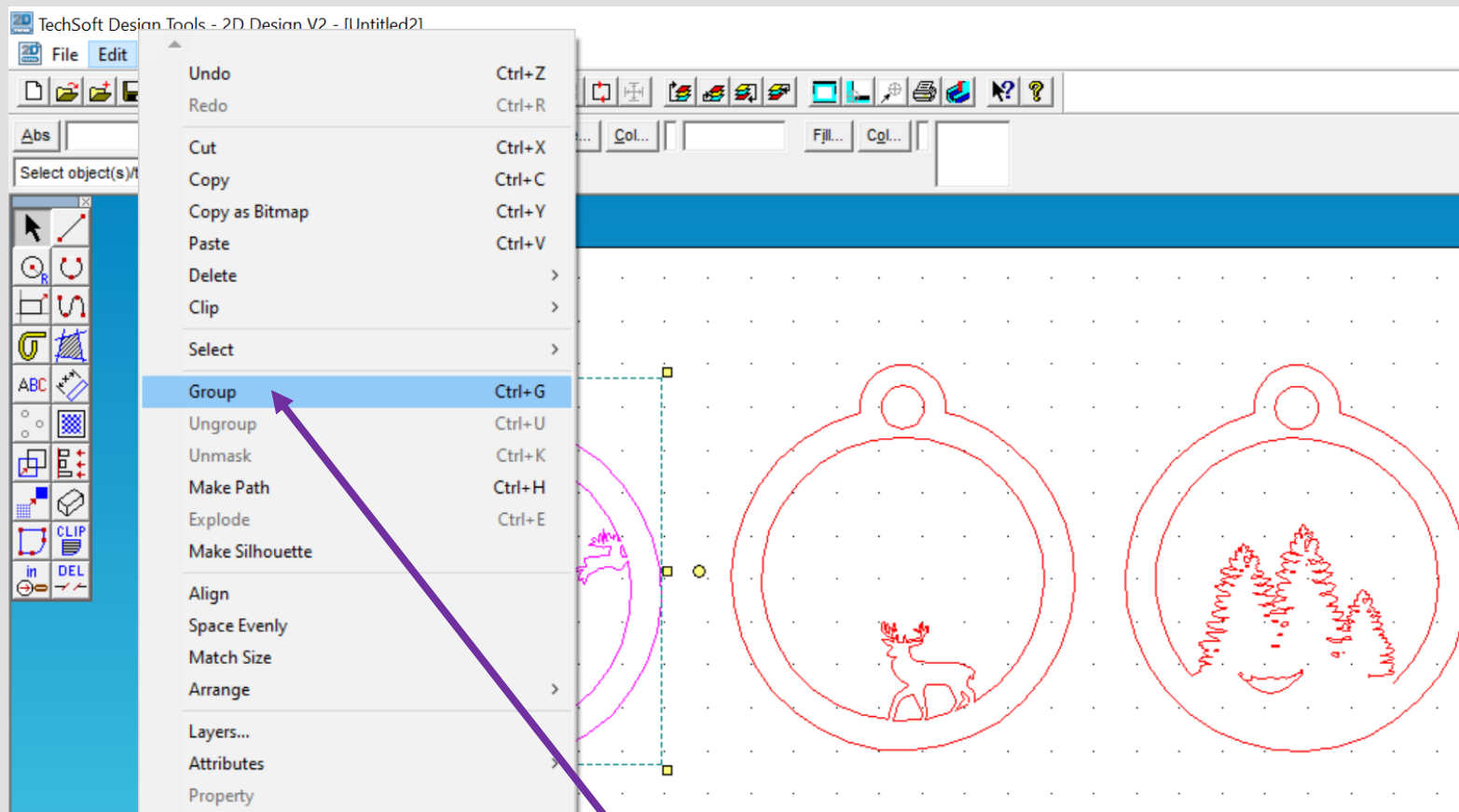
Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products



60. Select each of the baubles individually. Using the *edit tool*, click on the *group button*. You can now place one on top of the other to see if they work and adjust accordingly.

61. Design your own 3D bauble remember *red cuts out and blue engraves*




Innovation


Digital


Problem Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

I can connect and apply my knowledge and skills to create ideas and products

Learning Outcomes CAD Skills Checker

Learning Outcomes

- To develop advanced skills and problem solving skills when using 2D Design to draw and manufacture a 2D Christmas Bauble and a 3D Christmas Bauble to scale ready for laser cutting

By the end of this tutorial you will be able to...

- Import images
- Contour Bitmaps
- Draw a Christmas bauble using the correct size radius
- Using the skills you have learnt develop a 3D Christmas tree bauble
- Use the correct line colours to engrave and cut on a laser cutter

New Skills	Advanced Skills
Zoom tool <input type="checkbox"/>	Rotate tool <input type="checkbox"/>
Move tool <input type="checkbox"/>	Contour Bitmap tool <input type="checkbox"/>
Radius tool <input type="checkbox"/>	Vectorise Bitmap tool <input type="checkbox"/>
Line tool <input type="checkbox"/>	Text tool <input type="checkbox"/>
Rectangle tool <input type="checkbox"/>	Arc tool <input type="checkbox"/>
Circle tool <input type="checkbox"/>	Attach tool <input type="checkbox"/>
Eraser tool <input type="checkbox"/>	Contour tool <input type="checkbox"/>
Delete Part tool <input type="checkbox"/>	Line colour tool <input type="checkbox"/>



Innovation



Digital



Problem
Solving

Progression Step

I can use a variety of design communication methods and techniques to develop and present ideas clearly, and can respond constructively to feedback.

Learning Outcome

- connect and apply their knowledge and skills to create ideas and products