

Subject	Year 9 Core Knowledge – Autumn/Spring/Summer term	How to support students' learning
IT	<p>Autumn Term Digital Graphics -</p> <ol style="list-style-type: none"> 1. Know the properties of digital graphics: colour depth/bits per pixel and resolution. 2. Knows how bitmap and vector images are stored on a computer system. 3. Know how a vector graphic is different to a bitmap image. 4. Know what is meant by resolution and colour depth and understands how these can impact on the quality and size of an image. 5. Use basic tools of Adobe Illustrator to create a logo. 6. Use basic tools of Adobe Photoshop to manipulate an image. 7. Know how to use a range of selection tools including: magnetic lasso tool, rectangular marquee tool and magic eraser tool. 8. Explain the purpose of using a range of selection tools: magnetic lasso tool, rectangular marquee tool and magic eraser tool. 9. Know a range of advanced techniques that can be used to retouch images in Photoshop. 10. Explain the purpose of using a range of retouching techniques: clone stamp and dodge tool. 11. Create a visualisation diagram or flat plan. 12. Create a digital graphic for a given scenario. 13. Select the appropriate properties for this digital graphic (Height, Width and Resolution). 14. Use a range of advanced techniques to create a complex and effective digital graphic that meets the client brief. 15. Know a range of file formats used to store digital graphics. 	<ul style="list-style-type: none"> • Use the BBC Bitesize information to reinforce learning in this topic: https://www.bbc.co.uk/bitesize/guides/zv2v4wx/revision/1 • Use this website to help their understanding of vectors and bitmaps: https://www.youtube.com/watch?v=a6w4ghQPYu0 • Use these tutorial videos to help with Photoshop skills. https://helpx.adobe.com/uk/photoshop/how-to/ps-basics-fundamentals.html

16. Export graphics into a suitable file format that meets the client requirements.

Digital Games -

17. Analyse an existing game for its strengths and weaknesses.
18. Design and plan an original digital game.
19. Use game making software to create a single level with a background.
20. Create sprites and objects for a digital game.
21. Understand that game making software programming is based on Events and Actions.
22. Program basic instructions to control sprite movements.
23. Create and program obstacles in a digital game.
24. Create and program enemies in a digital game.
25. Know the basic concept of Object Orientated Programming.
26. Program players to fire projectiles within the game environment.
27. Understand how to use variables and IF statements within game making software.
28. Can use Boolean variables and IF statements within game making software.
29. Know how to test the game and complete a test table.
30. Evaluate the completed game and suggest appropriate improvements.

Spring Term

Computer Systems -

31. Identify the key internal components of a computer system: CPU, Memory and Hard drive.
32. Understand how to take apart a computer and put it back together again.
33. Know what logic gates are and how the main three logic gates work: AND, OR, NOT.

- Use these GDevelop tutorials to further develop skills in the software:
<https://gdevelop.io/academy>
- Wider reading on video game making:
<https://www.nuclino.com/articles/game-development>
- Useful blog listing 20 must-read game design articles for beginners:
<https://en.eagle.cool/blog/post/game-design-article>

- Use the BBC Bitesize information to reinforce learning in this topic:
<https://www.bbc.co.uk/bitesize/guides/zkkkw6f/revision/1>
<https://www.bbc.co.uk/bitesize/guides/z26rcdm/revision/1>
- Watch this YouTube to further enhance your understanding of logic gates:
<https://www.youtube.com/watch?v=bjVm8NPmyng>

34. Know how to identify the output of a series of logic gates based on their input.
35. Know how to interpret a logic circuit to complete a truth table.
36. Understand different units of measurement including: Bits, Bytes and KB.
37. Convert a denary number into a binary number and vice versa.
38. Understand how to use binary and ASCII to represent characters.
39. Know what an infographic is and understands its key features.
40. Ensure the infographic meets all the client requirements.
41. Ensure the layout conventions and design concepts have been effectively applied to the infographic.
42. Know how to export their final infographic in a digital document that can be accessed on smartphones and tablet devices.

Networks -

43. Know how data is sent across a network.
44. Understand the role of an IP address and can identify whether it is public or private.
45. Know the role of a range of basic hardware involved in networking, such as switches.
46. Understand the role of domain names.
47. Understand how DNS is used to find the IP address of a website.
48. Understand the pros and cons of splitting data into packets.
49. Know what packet switching is and understands why it is important.
50. Describe a range of online services.
51. Understand what is meant by cloud computing.
52. Describe the advantages and disadvantages of cloud computing.
53. Know about different ways to connect to a network.

- Additional resources on logic gates can be accessed on Oak Academy to stretch and challenge students:
<https://teachers.thenational.academy/lessons/logic-gates-61h64d>
- Additional resources on binary can be accessed on Oak Academy to stretch and challenge students:
https://teachers.thenational.academy/lessons/binary-mosaic-6d8t?from_query=binary
- Use the BBC Bitesize information to reinforce learning in this topic:
<https://www.bbc.co.uk/bitesize/guides/zvspf/cw/revision/5>
<https://www.bbc.co.uk/bitesize/topics/z7wt/b9q/articles/z3tbgk7>
- Encourage students to think about how they access the internet and what they use it for, ensuring security settings are set to protect them and their personal data (i.e. not automatically connecting to wireless hotspots).

54. Understand the advantages and disadvantages of wired vs wireless connections.
55. Know about different methods of connecting wirelessly to the internet.
56. Understand the security risks of connecting to public and private Wi-Fi.
57. Make informed decisions about how best to connect to the internet in different scenarios.

**Summer Term
Cyber Security -**

58. Explain the difference between data and information.
59. Critique online services in relation to data privacy.
60. Explain the need for the Data Protection Act
61. Understand the impact of human error and the security risks they pose to data.
62. Understand different strategies to minimise the risk of data being compromised through human error.
63. Define hacking in the context of cyber security.
64. Explain how a DDoS attack can impact users of online services.
65. Explain the need for the Computer Misuse Act.
66. Critique online services in relation to data privacy.
67. List the common malware threats.
68. Examine how different types of malware causes problems for computer systems.
69. Question how malicious bots can have an impact on societal issues.
70. Compare security threats against probability and the potential impact to organisations.
71. Explain how networks can be protected from common security threats.
72. Identify the most effective methods to prevent cyberattacks.

- Use the BBC Bitesize information to reinforce learning in this topic:
<https://www.bbc.co.uk/bitesize/guides/zycm97h/revision/1>
- Useful website to enhance their understanding of social engineering:
<https://saferkidsonline.eset.com/uk/article/identifying-common-social-engineering-attacks-to-kids>
- Play this Cyber Security interactive game:
<https://keeptraditionsecure.tamu.edu/>

	<p>Animation -</p> <ul style="list-style-type: none">73. Understand the different types of animation.74. Use the basic tools of Wick Editor animation software.75. Create a frame-by-frame animation using animation software.76. Make effective use of layers when creating an animation.77. Understand the purpose of tweening and why it's used in animation.78. Create an animation that uses tweening.79. Create their own assets in Wick Editor software by creating a traffic light animation.80. Identify a range of tools used in animation software.81. Identify a wide range of tools used in animation software.82. Confidently use Wick Editor software tools to create a fully functioning animation.	<ul style="list-style-type: none">• Encourage students to use Wick Editor to practice skills: https://www.wickeditor.com/editor/• Use this YouTube playlist with informative tutorials to develop skills in animation software: https://www.youtube.com/watch?v=KsPFoC_PWomQ&list=PL5fmsRtjcmEz9oal6u5NQP9FBCRq4yXZZ• YouTube tutorial for Frame-by-frame stickman animation: https://www.youtube.com/watch?v=SquQ5V_0wUg&t=81s• Some wider reading on different types of computer animation: https://www.animaker.com/blog/10-types-of-animations/
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