



Y6 Computing – 3D Modelling

Key Concepts – Creating Media



Essential Knowledge

How do you work in three dimensions on a computer?

As we learn to design in Tinker CAD, we add 3D shapes to our projects, explore them from different angles and carefully move them so they fit together to create a finished design.

How can I modify 3D objects?

As we develop our designs in Tinker CAD, we change the size of objects in three dimensions, lift and lower them to the right position and add colour to make our creations clear and visually effective.

How can objects be combined in a 3D model?

As our designs advance, we will rotate objects in three dimensions, duplicate shapes to save time and group objects together to create complete and detailed models.

Which 3D objects should I use to fit a purpose?

As we develop our 3D designs, we carefully adjust the size of objects, use shapes to create holes and combine different parts to build detailed and purposeful models.

How do I plan my own 3D model?

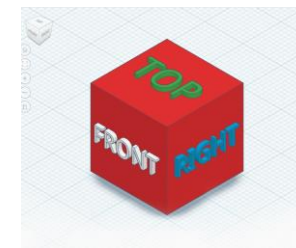
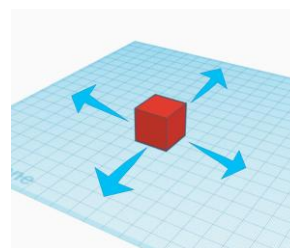
As we explore 3D models, we will look closely at designs, choose the most suitable objects and combine them carefully to create purposeful and effective creations.

What skills do I need to create my own 3D model?

As we bring our ideas to life, we will build a 3D model by following a design, think carefully about how it could be improved and make changes to refine and strengthen our final creation.

Key Vocabulary

Tinker CAD	a web-based 3D modelling and design tool
perspective	the angle or view from which you look at a model
duplicate	to make an exact copy of an object
placeholder	a temporary shape used to plan a design
hollow	empty inside rather than solid
2D	a flat shape with length and width
3D	a shape with length, width, and depth



Aspirational Knowledge

Use a range of tools in Tinker CAD to improve detailed 3D models for a purpose. Think creatively about how shapes can be combined, refined and adapted and evaluate work carefully to make thoughtful improvements, just like real designers and engineers.



Y6 Computing – 3D Modelling

Key Concepts – Creating Media



Key Knowledge

How do you work in three dimensions on a computer?

3D shapes can be added to a Tinker CAD design. Models can be viewed from different angles and shapes can be moved into the correct position.

How can I modify 3D objects?

3D objects can be made bigger, smaller, higher or lower. Colours can be changed to make designs clear and easy to understand.

How can objects be combined in a 3D model?

Objects can be rotated, duplicated and grouped together to create a complete 3D model.

Which 3D objects should I use to fit a purpose?

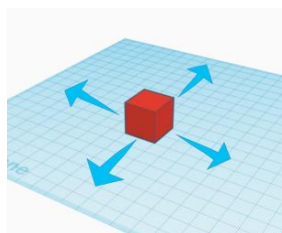
Different shapes have different uses. Shapes can be resized, turned into holes and combined to create a model for a specific purpose.

How do I plan my own 3D model?

Looking at existing models can help with planning. Choosing suitable shapes and combining them carefully helps create an effective design.

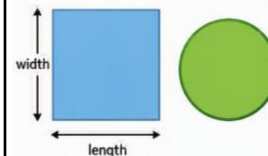
What skills do I need to create my own 3D model?

A 3D model can be created by following a design. Designs can be reviewed and improved by making changes and solving problems.



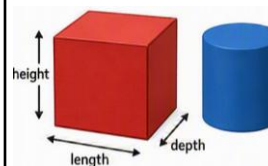
Key Vocabulary

2D



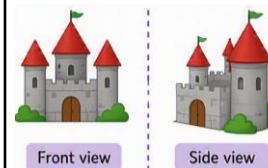
a flat shape and it has length and width

3D



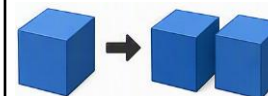
a shape that is not flat and it has length, width and depth

perspective



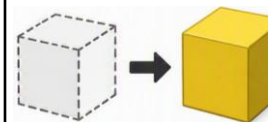
the view or angle you look at a model from

duplicate



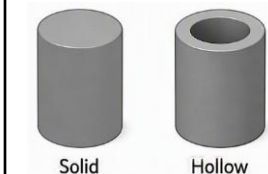
to copy an object and make another one that is the same

placeholder



a temporary shape used to help plan a design

hollow



empty inside



Y6 Computing – Communications & Collaboration

Key Concepts – Computer Systems and Networks



Essential Knowledge

How do computers communicate over the internet?

Computers follow agreed rules, called protocols, so that they can communicate with each other. Devices connected to the internet have an IP address, which helps other devices know where to send data. A Domain Name Server (DNS) changes a website address that we recognise into the IP address that computers use.

How is data transferred across the internet?

Data is broken into small pieces called packets before being sent across a network. Packets contain a header, which includes information needed to deliver the packet, and a data payload, which contains the actual data being sent. Text, images, audio and video can all be transferred in packets.

How does the internet help people work together?

The internet allows people in different locations to access shared files and work together. People can create, edit and share digital content without needing to be in the same place. Online collaboration can be public or private depending on who is allowed to access the work.

What are the different ways we can communicate online?

The internet allows information to be communicated in many ways. This can include messages, email, video calls and shared online documents. Different types of media, such as text, images, audio and video, can be shared using the internet.

How do we choose the best method of online communication?

Different methods of communication are suitable for different purposes. We should think about who we are communicating with, what we need to communicate and whether the information should be public or private before choosing a method.

How can we communicate safely and responsibly online?

Information shared online might not remain private, so we need to think carefully before sharing it. We should protect personal information and know how to report inappropriate content or ask a trusted adult for help if something online causes concern.

Key Vocabulary

protocol

a set of rules that computers follow to communicate

IP address

a unique address used to identify a device on a network

data packet

a small piece of data sent across a network

communication

sharing information with another person or device

collaboration

working together to complete a task or create something

Aspirational Knowledge

When data travels across the internet, it is split into packets. These packets can travel across networks before reaching their destination. Each packet contains a header with information about the packet and a data payload containing the data being transferred. This system allows many different types of data, including text, images, audio and video, to be transferred across the internet.



Y6 Computing – Communications & Collaboration

Key Concepts – Computer Systems and Networks



<u>Key Knowledge</u>		<u>Key Vocabulary</u>	
How do computers talk to each other? Computers can send information to each other. They follow rules called protocols.		protocol	rules computers follow to talk to each other
How is information sent online? Information is split into small pieces called data packets. These packets are sent across the internet.		IP address	the address of a device on a network
How can we work together online? We can use the internet to share our work. We can work on the same files with other people.		data packet	a small piece of information sent online
How can we talk to people online? We can communicate using messages, emails and video calls. We can also share pictures and files		communication	sending or sharing information
How do we choose how to communicate? We choose the best way to communicate depending on who we are talking to and what we want to share.		collaboration	working together
How do we stay safe when communicating online? We should think before we share information. Personal information should be kept private.			





Y6 Computing – Variables in Games

Key Concepts – Programming



Essential Knowledge

What are variables?

Variables can be used to store information that may change. The way a variable changes can be defined. Variables can hold different types of data, including numbers and letters.

Why are variables used in program?

A variable acts as a placeholder in a program's memory. Every variable has a name and a value. The value stored in a variable can be changed as a program runs.

How can we improve a game using variables?

Variables can be changed at different points in a program. Events can be used to set or update the value of a variable. The value stored in a variable can then be used by the program to control what happens next.

What is the role of a game designer?

Artwork can be chosen to suit the purpose of a project. Algorithms can be created to control how the project works. Design choices can be explained to show how they help achieve the intended outcome.

How can I use my design to create a project?

Artwork can be created to make a project engaging and suitable for its purpose. Variables can be given meaningful names that identify their role in a program. Code can be tested to check that the project works as intended and to find any errors.

What was successful in my project?

Games can be improved by identifying ways to make them more engaging or effective. Variables can be used to extend a game by adding new features and functionality. Finished games can be shared with others so they can play, test and provide feedback.

Aspirational Knowledge

Variables help computers remember information, like a player's score or time left in a game. By using variables, we can make games react to what the player does — for example, adding points when something is collected or ending the game when time runs out. Understanding how variables work helps us design smarter, more exciting games.

Key Vocabulary

variables	boxes that hold information a computer can remember and change, like a score in a game or a player's name
algorithm	a set of clear steps or instructions that tell a computer what to do, like a recipe for solving a problem
debug	to find and fix mistakes (bugs) in your code so the computer program works properly
code	the words and symbols we type to tell a computer what to do
program	a set of coded instructions that makes a computer perform a task, like a game or an app
designer	a person who plans and creates how something will look or work, such as a website, game or app



Y6 Computing – Variables in Games

Key Concepts – Programming



<u>Key Knowledge</u>		<u>Key Vocabulary</u>	
What are variables? Some information can change, like a score in a game. A variable can hold this information and store numbers or letters for the program to use.		variables	 boxes that hold information a computer can remember and change, like a score in a game or a player's name
Why are variables used in program? A variable has a name, so we know what it is for. A variable also has a value, and this value can change when the program is running.			
How can we improve a game using variables? You can choose where a variable changes in a program. An event, like pressing a button, can change the value of a variable.		algorithm	 ALGORITHM a set of clear steps or instructions that tell a computer what to do, like a recipe for solving a problem
What is the role of a game designer? Artwork can be chosen for a project. Simple instructions, called algorithms, can be created to make the project work. Design choices can be explained by saying why they were chosen.			
How can I use my design to create a project? Artwork can be created to make a project look interesting. Variables can be given clear names, so we know what they do. Code can be tested to check that the project works properly.		debug	 to find and fix mistakes (bugs) in your code so the computer program works properly
How successful was my project? Games can be made better by thinking about ways to improve them. Variables can be used to add new parts to a game, such as a score or timer. Finished games can be shared with other people so they can play them.		code	 the words and symbols we type to tell a computer what to do



Y6 Computing – Sensing Movement

Key Concepts – Programming



Essential Knowledge

How can I create a program to run on a controllable device?

Programming skills can be used in a new coding environment. Programs can be tested using an emulator to check that they work correctly. Finished programs can then be transferred to a controllable device so they can be used in the real world.

What controls the flow of a programme?

Conditions can be found in everyday life, where different things happen depending on a choice or situation. Variables can be used in 'if...then...else' statements to help a program make decisions. Selection controls the flow of a program by choosing what happens next based on whether a condition is true or false.

How can I use a conditional statement to compare a variable to a value?

Comparison operators, such as <, > and =, can be used in if, then statements to compare values and make decisions. The order of conditions in else, if statements is important because it affects which outcome is chosen. Programs can be modified to change how they work and achieve different outcomes.

How do I design a project that uses inputs and outputs on a controllable device?

Variables can be chosen to store the information needed in a project. An algorithm can be designed to plan the steps the program will follow. The flow of the program can also be designed to show how different parts of the project connect and work together.

How can I use my design to create a project?

Artwork can be created to match the purpose and style of a project. Variables can be given meaningful names that clearly identify their role within a program. Code can be tested throughout development to check that it works correctly and to identify any errors that need to be fixed.

How do I develop a program that uses inputs and outputs on a controllable device?

A program can be created by following a planned design. The program can be tested against the design to check that it meets its intended purpose. A range of debugging approaches can be used to identify, investigate and fix bugs that occur during development.

Aspirational Knowledge

Variables are used to store information that can change. Inputs and outputs help devices interact with the world around them. Programming skills can be combined to create, test and improve programs that control real devices. By the end, we will understand how programs use variables, inputs and outputs to make devices respond and carry out different actions.

Key Vocabulary

program	a set of coded instructions that makes a computer perform a task, like a game or an app
flow	flow is the order in which instructions in a program are carried out, showing how the program moves from one step to the next
output	output is the information a program produces after it runs, such as text on a screen, a sound, or movement from a device
algorithm	a set of clear steps or instructions that tell a computer what to do, like a recipe for solving a problem
variable	boxes that hold information a computer can remember and change, like a score in a game or a player's name
condition	a condition is a rule or question in a program that checks whether something is true or false and decides what happens next



Y6 Computing – Sensing Movement

Key Concepts – Programming



Key Knowledge

How can I create a program to run on a controllable device?

Coding skills can be used in a new place. We can test our code to check if it works. We can also write code to make a device do different jobs.

What controls the flow of a programme?

Conditions are things that help a program make a choice. Variables can help the program decide what to do next by following simple 'if...then...else' rules.

How can I use a conditional statement to compare a variable to a value?

Comparison signs such as <, > and = help a program compare things. The order of the rules is important because it helps the program choose what to do next.

How do I design a project that uses inputs and outputs on a controllable device?

Variables can be picked to hold important information. We can plan the steps our program will follow. We can also decide what the program will do first, next and last.

How can I use my design to create a project?

Artwork can be created to make a project look the way we want it to. Variables can be given simple names to help us remember what they are for. Code can be tested to check that it works and to find any mistakes.

How do I develop a program that uses inputs and outputs on a controllable device?

A program can be made by following a plan or design. The program can be tested to check that it works in the way it was planned.

Key Vocabulary

variables



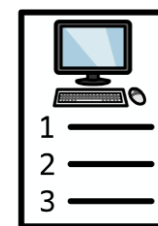
boxes that hold information a computer can remember and change, like a score in a game or a player's name

algorithm



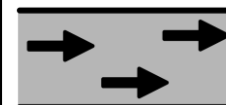
a set of clear steps or instructions that tell a computer what to do, like a recipe for solving a problem

program



a set of coded instructions that makes a computer perform a task, like a game or an app

flow



flow is the order instructions in a program are carried out, showing how the program moves from one step to the next



Y6 Computing – Spreadsheets

Key Concepts – Data & Information



Essential Knowledge

How is data collected?

Data can be collected to answer questions and find information. Data can be organised into groups, so it is easy to understand. The data can then be entered into a spreadsheet where it can be stored and explored.

What is formatting in a spreadsheet?

An item of data is one piece of information. Different cells can be set up for different types of information, such as words or numbers. Cells can be changed so the information is shown in the right way.

How do you use formulas?

Different types of data can be used in calculations, such as numbers. Formulas can be created in a spreadsheet to work out answers automatically. Changing the information that goes into a formula can change the result that comes out.

Why do we need formulas in spreadsheet?

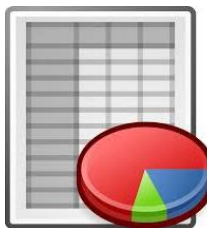
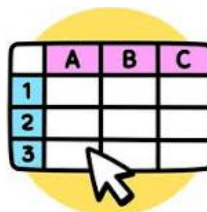
Different calculations can be carried out using operations such as adding, subtracting, multiplying and dividing. Formulas can use information from more than one cell to work out an answer. A formula can be copied into other cells so it can be used again without having to write it each time.

How can I plan an event using a spreadsheet?

Spreadsheets can be used to answer questions by organising and exploring data. Data should be organised carefully, so it is easy to find and understand. Formulas can be used to calculate information and help answer questions more quickly.

How can I present data in different ways?

Charts can be created to show information clearly and help us understand data. Charts can be used to answer questions by making patterns and results easier to see. Sometimes a table is the best way to show information, while other times a chart can help us understand it more quickly.



Aspirational Knowledge

Data can be collected and organised in spreadsheets to help answer questions and solve problems. Formulas can be used to calculate information automatically, and changing the data can affect the results. By creating charts and tables, information can be presented clearly and used to compare, interpret and evaluate data.

Key Vocabulary

data	information that can be collected, organised, and used — such as numbers, words, or facts
format	the way data looks — for example, changing colour, font, or showing numbers as money or dates
formula	a rule or calculation written in a spreadsheet to work something out automatically
cell	a single box in a spreadsheet where you can type data or a formula
range	a group of cells selected together, often used in a formula
duplicating	copying something, like a formula or data, so it appears in more than one place



Y6 Computing – Spreadsheets

Key Concepts – Data & Information



Essential Knowledge

How is data collected?

Data can be collected to find things out. The data can be typed into a spreadsheet, so it is stored in one place and is easy to look at.

What is formatting in a spreadsheet?

An item of data is one piece of information. Cells can be set up to hold different types of information, such as words or numbers.

How do you use formulas?

Numbers can be used in calculations. Formulas can be written in a spreadsheet to help work out answers automatically.

Why do we need formulas in spreadsheet?

Numbers can be used in calculations. Formulas can be written in a spreadsheet to help work out answers automatically.

How can I plan an event using a spreadsheet?

Spreadsheets can help us answer questions. Formulas can be used to work out information and help us find the answers we need.

How can I present data in different ways?

Charts can be made to show information in a clear way. Charts can help us find answers to questions by making the information easier to see and understand.

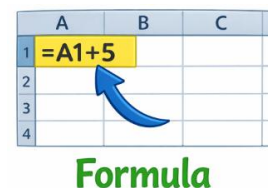
Key Vocabulary

data

NUMBER WORDS		
1 one	11 eleven	30 thirty
2 two	12 twelve	40 forty
3 three	13 thirteen	50 fifty
4 four	14 fourteen	60 sixty
5 five	15 fifteen	70 seventy
6 six	16 sixteen	80 eighty
7 seven	17 seventeen	90 ninety
8 eight	18 eighteen	100 one-hundred
9 nine	19 nineteen	
10 ten	20 twenty	

information we collect, like numbers or words

formula



a rule that tells the computer how to calculate something

cell

Highlight Cells in Excel Based on Value				
		January	February	March
Salesman	Sales Area			
Ana Hatha	New Orleans	60	42	40
Tom Mach	Houston	38	47	38
Chris Jordan	Boston	46	33	39
Nancy Flora	Chicago	36	36	63
Mark Buam	New Orleans	62	66	69
Jack Harold	Chicago	34	61	31
Erna Gomes	Seattle	63	36	58

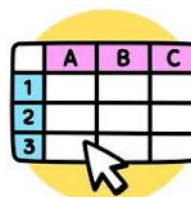
one small box in a spreadsheet where you can type data or a formula

range

75	95	47	5	9	85
24	49	79	96	95	78
47	99	94	86	28	31
52	55	61	65	94	50
36	29	86	72	17	49
15	43	10	80	83	97

Level	Color
Below than 25	Below
25-75	Between
Above than 75	Above

a group of cells selected together in a spreadsheet





Y6 Computing – Webpage Creation

Key Concepts – Creating Media



Essential Knowledge

What makes a good website?

Websites can be explored using navigation tools. Different types of media are used on websites. They are created using HTML (HyperText Markup Language). A users' experience will depend on the design of the website.

What is the role of a web designer?

A web designer will know how to recognise the common features of a web page, select appropriate media to include on a webpage, and design a webpage layout that is suitable for its intended purpose.

What is copyright and how does it protect creators?

It is important to use copyright-free images. These are readily available on the internet for everyone to use. It is important to apply 'fair-use' when using these images.

How do I create a website?

Websites are created when creators add content to a webpage. They can be previewed to see how they look. This helps creators to evaluate and improve their appearance, across different devices.

What is a navigation path and how can it help people to navigate a website?

A navigation path is a useful tool to help users explore a website to find what they are looking for. Web pages can be linked together using hyperlinks to support navigation.

What is the implication of linking content owned by other people?

You must consider the implications of linking to content owned by others. It is possible to create hyperlinks to other people's work; these links can affect the user experience of a website.

Key Vocabulary

web page	a site on the internet, containing information about a specific thing
browser	a tool that you use online to navigate the internet
media	different methods for sharing information online
hypertext markup language (html)	a special computer language
hyperlink	a tool to take you to a different place on the internet



Aspirational Knowledge

The **Domain Name System (DNS)** is like the internet's phone book. It helps your computer find websites by changing easy-to-remember names, like 'example.com', into special numbers called IP addresses. Computers need these numbers to connect to each other. So, when you type a website name into your browser, DNS finds its unique IP address, so your computer knows where to go.



Y6 Computing – Webpage Creation

Key Concepts – Creating Media



Key Knowledge

What makes a good website?

Websites are explored using different tools to help the user move around on the site. Websites are written using special computer language. To be a good website, the user must be able to move around and find the information they need.

What is the role of a web designer?

Web designers know how to recognise the common features of a web page, choose appropriate media to include on a webpage, and design a webpage layout that is suitable for its users.

What is copyright and how does it protect creators?

It is important that copyright-free images are used. We can find copy-right free resources in our work. This stops designers from using others' work as their own.

How do I create a website?

Websites are created when information is added to a webpage. Pages can be previewed so you can see how a webpage appears and improve its appearance across different devices.

What is a navigation path and how can it help people to navigate a website?

A navigation path is a way of getting around a website. It is a useful tool along with hyperlinks to help users find what they are looking for.

How can I link content owned by other people?

You can create hyperlinks to other people's work. Links can affect the users' experience of a website.

Key Vocabulary

web page



a place on the internet with lots of information

browser



a tool to take you around the internet

media



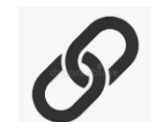
different ways you can share information

hypertext markup language (HTML)



a special computer language

hyperlink



a tool to take you to a different place on the internet