| **Our Lady & St Patrick’s Catholic Primary Schools**  |
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| **Curriculum Flight Path: Computing** |
|  | Early Years | Year 1 (1/2 Year A) | Year 2 (1/2 Year B) | Year 3 (3/4 Year A) | Year 4 (3/4 Year B) | Year 5 (5/6 Year A) | Year 6 (5/6 Year B) |
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| **Possible Themes** | **Computing systems and networks 1: Using a computer** | **Improving Mouse Skills****+ Online safety - year 1****Lesson 1** | **What is a computer?****+ Online safety - Year 2****Lesson 1** | **Online safety - Year 3** | **Online safety - Year 4** | **Online safety - Year 5** | **Online safety - Year 6** |
| **Substantive knowledge***As a computer scientist, I am learning about* | The main parts of a computer and how to use the keyboard and mouse. Logging in and out of a computer.learning about what a mouse is and to develop basic mouse skills such as moving and clicking.Learn what a mouse is and to develop basic mouse skills such as moving and clicking. | Learning how to explore and tinker with hardware to find out how it works.Learning where keys are located on the keyboard.Using a basic range of tools within graphic editing software.Developing control of the mouse through dragging, clicking and resizing of images to create different effects.Developing understanding of different software tools.Recognising devices that are connected to the internet.Logging in and out and saving work on their own account. | Understanding what a computer is and that it’s made up of different components.Recognising that buttons cause effects and that technology follows instructions.Learning how we know that technology is doing what we want it to do via its output.Using greater control when taking photos with cameras, tablets or computers.Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.Using word processing software to type and reformat text.Creating and labelling images.Learning how computers are used in the wider world |  not everything on the internet is true: people share facts, beliefs and opinions online. that the internet can affect your moods and feelings.how privacy settings limit who can access your important personal information, such as your name, age, gender etc.what social media is and that age restrictions apply.  | Understanding why some results come before others when searching.Understanding that information found by searching the internet is not all grounded in fact.Learning to make judgments about the accuracy of online searches.Identifying forms of advertising online.Reflecting on the positives and negatives of time online.Identifying respectful and disrespectful online behaviour.Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others | Understand that passwords need to be strong and that apps require some form of passwords.Recognise a couple of the different types of online communication and know who to go to if they need help with any communication matters online.Search for simple information about a person, such as their birthday or key life moments.Know what bullying is and that it can occur both online and in the real world.Recognise when health and wellbeing are being affected in either a positive or negative way through online use.Offer a couple of advice tips to combat the negative effects of online use. | Learning about the positive and negative impacts of sharing online.Learning strategies to create a positive online reputation.Understanding the importance of secure passwords and how to create them.Learning strategies to capture evidence of online bullying in order to seek help.Recognising that updated software can help to prevent data corruption and hacking. |
| **Disciplinary Knowledge***As a computer scientist, I am learning to* | To learn what a keyboard is and how to locate relevant keys.Understand why we need to log in and out.Use a simple online paint tool to create digital art.Use a simple online paint tool to create digital art.To learn what a mouse is and to develop basic mouse skills such as moving and clicking. | To know that “log in” and “log out” means to begin and end a connection with a computerTo know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.To know that passwords are important for security. | To know the difference between a desktop and laptop computer.To know that people control technology.To know some input devices that give a computer an instruction about what to do (output).To know that computers often work together. |  know that not everything on the internet is true: people share facts, beliefs and opinions online. understand that the internet can affect your moods and feelings. know that privacy settings limit who can access your important personal information, such as your name, age, gender etc. know what social media is and that age restrictions apply. |  understand some of the methods used to encourage people to buy things online. understand that technology can be designed to act like or impersonate living things. understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology. understand what behaviours are appropriate in order to stay safe and be respectful online. | Identify possible dangers online and learning how to stay safe.Evaluate the pros and cons of online communication.recognise that information on the Internet might not be true or correct and learning ways of checking validity.about what to do if they experience bullying online.Learning to use an online community safely. | To know that a digital footprint means the information that exists on the internet as a result of a person’s online activity.To know what steps are required to capture bullying content as evidence.To understand that it is important to manage personal passwords effectively.To understand what it means to have a positive online reputation.To know some common online scams. |
| **Possible leading enquiry question**  | Where are the different parts of a computer? | How do I use a mouse? | What is a computer? | How do I keep myself safe when I am online?  | How can other people online affect my opinion?  | How do I communicate online safely?  |  |
| **Vocabulary** (progressive – so what are the new words?) | ComputerComputer towerMonitorKeyboardMouseLettersNumbersUppercaseLowercaseTypeComputerMonitorKeyboardMouseLog inLog outComputer safetyProtectPasswordPrivateSecureSecurityLockLeft clickRight clickArrowCursorClickDragMoveDrop | Log inLoginLog out / offMouseMouse pointerClickKeyboardScreenPasswordAccountSoftwareDuplicateCtrlToolsRight clickMenuLayersUsernameDragDrag and dropDigital photographUndoCursor | BatteryButtonsCameraComputerDesktopDeviceDigitalDigital recorderElectricityFunctionInputInventionKeyboardLaptopMonitorMouseOutputPaying tillScannerScreenSystemTabletTechnologyVideoWires | AccurateAge-restrictedAutocompleteBeliefsBlockContentDigital devicesFactFake newsInternetOpinionPasswordPersuasivePrivacy settingsReliableReportRequestsSearch engineSecurity questionsSharingSmart devicesSocial media platformsSocial networkingWellbeing | AccuracyAdvantagesAdvertisementsBeliefBotChatbotComputerDistractionsFactHashtagImplicationsIn-app purchasesInfluencerOpinionProgramRecommendationsReliableRisksScreen timeSearch resultsSnippetsSponsoredTrustworthy | Accurate informationAdviceApp permissionsApplicationAppsBullyingCommunicationEmojisHealthIn-app purchasesInformationJudgementMemesMental healthMindfulnessMini-biographyOnline communicationOpinionOrganisationPasswordPersonal informationPositive contributionsPrivate informationReal worldStrong passwordSummariseSupportTechnologyTrusted adultWellbeing | AnonymityAntivirusBiometricsBlock and reportConsentCopyDigital footprintDigital personalityFinancial informationHackingInappropriateMalwareOnline bullyingOnline reputationPasswordPastePersonal informationPersonalityPhishingPrivacy settingsPrivateReliable sourceReportReputationRespectScammersScreengrabSecureSettingsSoftware updatesTwo factor authenticationURLUsername |
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| Possible Theme | **Programming 1 - all about instructions** | **Programming Algorithms unplugged****+ online safety lesson 2** | **Programming Scratch Jr****+ online safety lesson 2** | **Programming 1- Scratch** | **Computational thinking** | Programming music: Scratch | Programming: Intro to Python |
| **Substantive knowledge***As a \*\*\*\*\*\*\*\*er, I am learning about* | Learn to receive and give instructions and understand the importance of precise instructions.To learn to give simple instructionsTo learn that an algorithm is a set of instructions to carry out a task, in a specific order | Recognising that some devices are input devices and others are output devices.Learning that decomposition means breaking a problem down into smaller parts.Using decomposition to solve unplugged challenges.Developing the skills associated with sequencing in unplugged activities.Following a basic set of instructions.Assembling instructions into a simple algorithm.Learning to debug instructions when things go wrong.Learning to debug an algorithm in an unplugged scenario. | Recognising that buttons cause effects and that technology follows instructionExplaining what an algorithm is.Following an algorithm.Creating a clear and precise algorithm.Learning that programs execute by following precise instructions.Incorporating loops within algorithms.Using logical thinking to explore software, predicting, testing and explaining what it does.Using an algorithm to write a basic computer program.Using loop blocks when programming to repeat an instruction more than once.Using software (and unplugged means) to create story animations. | Using decomposition to explore the code behind an animation.Using repetition in programs.Using logical reasoning to explain how simple algorithms work.Explaining the purpose of an algorithm.Forming algorithms independently.Using logical thinking to explore more complex software; predicting, testing and explaining what it does.Incorporating loops to make code more efficient.Continuing existing code.Making reasonable suggestions for how to debug their own and others’ code. | Using decomposition to solve a problem by finding out what code was used.Using decomposition to understand the purpose of a script of code.Identifying patterns through unplugged activities.Using past experiences to help solve new problems.Using abstraction to identify the important parts when completing both plugged and unplugged activities.Creating algorithms for a specific purpose.Using abstraction and pattern recognition to modify code. | Predicting how software will work based on previous experience.Writing more complex algorithms for a purpose.Iterating and developing their programming as they work.Confidently using loops in their programming.Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.Writing code to create a desired effect.Using a range of programming commands.Using repetition within a program.Amending code within a live scenario.Using logical thinking to explore software more independently, making predictions based on their previous experience.Using a software programme (Scratch) to create music.Identify ways to improve and edit programs, videos, images etc. | Decomposing a program into an algorithm.Writing increasingly complex algorithms for a purpose.Debugging quickly and effectively to make a program more efficient.Remixing existing code to explore a problem.Using and adapting nested loops.Programming using the language Python.Changing a program to personalise it.Evaluating code to understand its purpose.Using logical thinking to explore software independently, iterating ideas and testing continuously. |
| **Disciplinary Knowledge***As a \*\*\*\*\*\*\*\*er, I am learning to* | To follow instructions as part of practical activities and gamesTo learn to give simple instructionsTo follow instructions as part of practical activities and games and to learn to debug when things go wrong | To understand that an algorithm is when instructions are put in an exact order.To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.To know that we call errors in an algorithm ‘bugs’ and fixing these ‘debugging’. | To know that coding is writing in a special language so that the computer understands what to do.To understand that the character in ScratchJr is controlled by the programming blocks.To know that you can write a program to create a musical instrument or tell a joke. |  know that Scratch is a programming language and some of its basic functions. understand how to use loops to improve programming. understand how decomposition is used in programming. understand that you can remix and adapt existing code. |  know that combining computational thinking skills can help you to solve a problem. understand that pattern recognition means identifying patterns to help them work out how the code works. understand that algorithms can be used for a number of purposes e.g. animation, games design etc. | know that a soundtrack is music for a film/video and that one way of composing these is on programming software. understand that using loops can make the process of writing music simpler and more effective. know how to adapt their music while performing. | To know that there are text-based programming languages such as Logo and Python.To know that nested loops are loops inside of loops.To understand the use of random numbers and remix Python code. |
| **Possible leading enquiry question**  | Why is it important to follow instructions in the right order? | What is an algorithm? | How do I programme Scratch? | How can I animate a cartoon cat using a computer?  | How can computational thinking skills help me solve a problem?  | How can I adapt music while I perform?  | How do I programme with pythonP |
| **Vocabulary** (progressive – so what are the new words?) | InstructionsBlindfoldStep overWalk aroundTurnLeftRightTo the sideStraight onStand stillStopDuckUnderBend downWalkHopTiptoeShuffleSkipRunInstructionsTimerDescribeAdjectiveTwo-part instructions | AlgorithmAutomaticBugChunksClearCodeDebugDecomposeDecompositionDeviceDirectionsInputInstructionsManageableMotionOrderOrganiseOutputPreciseProgrammingProblemRobotSensorSequenceSolutionSpecificStepsTasksVirtual assistant | AlgorithmAnimationBlocksBugButtonCGIComputer codeCodeDebugFluidIconImitateInstructionsLoop'On tap'ProgrammingRepeatScratchJRSequenceSound recording | AlgorithmAnimationApplicationCodeCode blockCoding applicationDebugDecomposeInterfaceGameLoopPredictProgramRemixing codeRepetition codeReviewScratchSpriteTinker | AbstractionAlgorithmCodeComputational thinkingDecompositionInputLogical reasoningOutputPattern recognitionScriptSequenceVariable | BeatBugsCodingCommandDebugDecomposeErrorInstructionsLoopMelodyMindmapMusicOutputPerformancePitchPlanPlayPredictProgrammingRepeatRhythmScratchSoundtrackSpacingTempoTimbreTinkerTutorialsTyping | AlgorithmCodeCommandDesignImportIndentationInputInstructionsLoopOutputPatternsRandomRemixRepeatShape |
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| Possible Theme | **Exploring hardware** | **Digital imagery****+ online safety lesson 3** | **Stop Motion** **+ online safety lesson 3** | Computing systems and Networking 2- emailing | Data Handling:Investigating weather | Computing systems and Networking- Search Engines | Data HandlingBig Data |
| **Substantive knowledge***As a \*\*\*\*\*\*\*\*er, I am learning about* | Tinkering and exploring with different computer hardware and learning to operate a camera.Recognise that a range of technology is used in places such as homes and schools. how to operate a camera and/or iPad and use it to take photographs. | Learning how to explore and tinker with hardware to find out how it works.Learning where keys are located on the keyboard.Learning how to operate a camera to take photos and videos.Developing the skills associated with sequencing in unplugged activities.Using a basic range of tools within graphic editing software.Taking and editing photographs.Developing control of the mouse through dragging, clicking and resizing of images to create different effects.Developing understanding of different software tools.Searching and downloading images from the internet safely.When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. | Using logical thinking to explore software, predicting, testing and explaining what it does. | logging in and out of an email account.Writing an email including a subject, ‘to’ and ‘from’.Sending an email with an attachment.Replying to an email.the purpose of emails.about cyberbullying.that not all emails are genuine, recognising when an email might be fake and what to do about it. | Using tablets or digital cameras to film a weather forecast.Understanding that weather stations use sensors to gather and record data that predicts the weather.Using keywords to effectively search for information on the internet.Searching the internet for data.Designing a device that gathers and records sensor data.Recording data in a spreadsheet independently.Sorting data in a spreadsheet to compare using the ‘sort by…’ option.Understanding that data is used to forecast weather. | Developing searching skills to help find relevant information on the internet.Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.Learn about different forms of communication that have developed with the use of technology.Recognising that information on the Internet might not be true or correct and learning ways of checking validity. | Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).Understanding that computer networks provide multiple services.Using search and word processing skills to create a presentation.Creating formulas and sorting data within spreadsheets.Learning about the Internet of Things and how it has led to ‘big data’.Learning how ’big data’ can be used to solve a problem or improve efficiency. |
| **Disciplinary Knowledge***As a \*\*\*\*\*\*\*\*er, I am learning to* | To explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.Explore and tinker with hardware to develop familiarity and introduce relevant vocabularyTo learn how to operate a camera and/or iPad and use it to take photographs.To learn how to operate a camera and/or iPad and use it to take photographs. | To understand that holding the camera or device still and considering angles and light are important to take good pictures.To know that you can edit, crop and filter photographs.To know how to search safely for images online. | To understand that an animation is made up of a sequence of photographs.To know that small changes in my frames will create a smoother looking animation.To understand what software creates simple animations and some of its features e.g. onion skinning. |  understand that email stands for ‘electronic mail.’ know that an attachment is an extra file added to an email. understand that emails should contain appropriate and respectful content. know that cyberbullying is bullying using electronics such as a computer or phone. | know that computers can use different forms of input to sense the world around them so that they can record and respond to data (‘sensor data’). know that a weather machine is an automated machine that respond to sensor data. understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films. | know how search engines work.understand that anyone can create a website and therefore we should take steps to check the validity of websites. know that web crawlers are computer programs that crawl through the internet. understand what copyright is. | To know that data can become corrupted within a network but this is less likely to happen if it is sent in ‘packets’.To know that devices or that are not updated are most vulnerable to hackers.To know the difference between mobile data and WiFi. |
| **Possible leading enquiry question**  | How can I use a device to take a picture? |  |  | How do I send an email safely?  | What is data?  | How can I find things online?  |  |
| **Vocabulary** (progressive – so what are the new words?) | MouseButtonsKeyboardKeysMotherboardUSB stickSystem fanHard driveMonitorComputer towerSpeakerClickPushPullTwistUnderOn top ofBehindOpenShutLargerSmallerLargerSmallerComputerDialMemoryTechnologyPowerElectricityBatteriesClickPushPullTwistOnOff | BackgroundBlurredCameraClearCropDeleteDeviceDigital cameraDownloadDrag and dropEditEditing softwareFilterImageImportInternetKeywordOnlinePhotographResizeSave asScreenSearch engineSequenceSoftwareStorage spaceVisual effects | AnimationBackgroundDebugDrawingEvaluateFlipbookFluidFramesMoving objectsOnion skinningPen toolStill imagesStatic | AttachmentBcc (Blind carbon copy)Cc (Carbon copy)ComposeContentCyberbullyingDocumentDomainDownloadEmailEmail accountEmail addressEmojiEmotionsFakeFontGenuineHackerIconsInboxInformationLinkLog inLog outNegative languagePasswordPersonal informationPositive languageReplyResponsible digital citizenScammerSettingsSendSign inSpam emailSubject barThemeToneUsernameVirusWiFi | AccurateBackdropClimate zoneColdCollaborationCondensationCylinderDegreesEvaporationExtreme weatherForecastHeat sensorLightningMeasurementPinwheelPresenterRainSatelliteScriptSensitiveSensor dataSolar panelTablet/Digital cameraTemperatureThermometerTornadoWarmWeatherWeather forecastWind | AlgorithmAppropriateCopyrightCorrectCreditData leakDeceiveFairFakeInappropriateIncorrectIndexInformationKeywordsNetworkPrivacyRankRealSearch engineTASKWeb crawlerWebsite | Big DataBluetoothCorruptedDataEnergyGPSImproveInfraredInternet of ThingsPersonalPrivacyQR codesRevolutionRFIDSIMSimulationSmart citySmart schoolStop motionThreatWiFiWireless |
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| **Possible Theme** | **Programming bee-bots - depending on availability!** | **Data Handling: Introduction to Data****+ online safety lesson 4** | **Data Handling: Space Station****+ online safety lesson 4** | Video trailers 1: Using devices other than ipads | Creating media: Website design | Creating Media- stop motion animation | Skills showcase: Inventing a product |
| **Substantive knowledge***As a \*\*\*\*\*\*\*\*er, I am learning about* | Using directions and experimenting with programming a Bee-bot/Blue-bot and tinkering with hardware.To experiment with programming a Bee-bot/Blue-bot.Experiment with programming a Bee-bot/Blue-bot and to learn how to give simple commandsFollowing an algorithm as part of an unplugged game.Debugging instructions, with the help of an adult, when things go wrong. | Learning how to explore and tinker with hardware to find out how it works.Recognising that some devices are input devices and others are output devices.Learning where keys are located on the keyboard.Developing control of the mouse through dragging, clicking and resizing of images to create different effects.Developing understanding of different software tools.Recognising devices that are connected to the internet.Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc.Using data representations to answer questions about data.Using software to explore and create pictograms and branching databases. | Developing confidence with the keyboard and the basics of touch typing.Creating and labelling images.Collecting and inputting data into a spreadsheet.Interpreting data from a spreadsheet.Learning how computers are used in the wider world. | Using logical thinking to explore more complex software; predicting, testing and explaining what it does.Taking photographs and recording video to tell a story.Using software to edit and enhance their video adding music, sounds and text on screen with transitions. | Building a web page and creating content for it.Designing and creating a webpage for a given purpose.Using software to work collaboratively with others. | Decomposing animations into a series of images.Decomposing a story to be able to plan a program to tell a story.Using video editing software to animate. | Using past experiences to help solve new problems.Writing increasingly complex algorithms for a purpose.Debugging quickly and effectively to make a program more efficient.Remixing existing code to explore a problem.Changing a program to personalise it.Evaluating code to understand its purpose.Predicting code and adapting it to a chosen purpose.Using logical thinking to explore software independently, iterating ideas and testing continuously.Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.Using design software TinkerCAD to design a product.Creating a website with embedded links and multiple pages.Understanding how search engines work.Using search engines safely and effectively |
| **Disciplinary Knowledge***As a \*\*\*\*\*\*\*\*er, I am learning to* | Understand the meaning of directional arrowsFollow a simple sequence of instructions.Explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.To learn to debug instructions, with the help of an adult, when things go wrongTo learn that an algorithm is a set of instructions to carry out a task, in a specific orderTo learn to debug instructions, with the help of an adult, when things go wrongTo experiment with programming a Bee-Bot/Blue-Bot and to learn how to give simple commands | To know how charts and pictograms can be created using a computer.To understand that a branching database is a way of classifying a group of objects.To know that computers understand different types of ‘input’. | To understand that you can enter simple data into a spreadsheet.To understand what steps you need to take to create an algorithm.To know what data to use to answer certain questions.To know that computers can be used to monitor supplies. |  know that different types of camera shots can make my photos or videos look more effective. know that I can edit photos and videos using film editing software. understand that I can add transitions and text to my video. |  know that a website is a collection of pages that are all connected. know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks. know that websites should be informative and interactive. | know that decomposition of an idea is important when creating stop-motion animations. understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. know that editing is an important feature of making and improving a stop motion animation. | To use a software program to design their products To know what designing an electronic product involves.To know which programming software/language is best to achieve a purpose.To know the building blocks of computational thinking e.g. sequence, selection, repetition, variables and inputs and outputs. |
| **Possible leading enquiry question**  | How can you make the bee bot move to follow the road? |  |  | How can I film without an ipad?  | How do I design a website?  | What is stop motion animation?  |  |
| **Vocabulary** (progressive – so what are the new words?) | forwardbackbackwardsrightleftarrowdirectionturnstraight ondirectionsrouteDirectionsProgramForwardAlgorithmInstructionsBackCircleArrowDirectionTurnStraight onAlgorithmDebugBackForwardBackwardsProgramInstructionsSequence | Bar chartBlock graphBranching databaseCategoriseChartClick and dragCompareCountDataData collectionData recordData representationEditInputKeyboardLine graphMouseInformationLabelPictogramPie chartProcessRecordResizeSortTableTallyValues | AlgorithmAstronautDataDigitalDigital contentExperimentGalaxyInsulationInteractive mapInternational Space CentreInternational Space StationInterpretLaboratoryMonitorPlanetSatelliteSensorSpaceTemperatureThermometerWater reservoir | ApplicationCamera angleClipCross blurCross fadeCross zoomDesktopDigital deviceDip to blackDirectional wipeEditFilmFilm editing softwareGraphicsImportKey eventsLaptopMusicPhotoPlanRecordingSound effectsStoryboardTime codeTrailerTransitionVideoVoiceove | AssessmentAudienceChecklistCollaborationContentContributionCreateDesignEmbedEvaluateFeaturesGoogle SItesHobbyHomepageHyperlinksImagesInsertOnlinePlanProgressPublishedRecordReviewStyleSubpageTabThemeWeb pageWebsiteWorld Wide Web | AnimationAnimatorBackgroundCharacterDecompositionDesignDigital deviceEditEvaluateFlip bookFluid movementFramesModelMoving imagesOnion skinningStill imagesStop motionStoryboardThaumatropeZoetrope | AdaptAdvertAlgorithmBugsCodingDebuggingDesignEditElectronicEvaluateFactsImage rightsImagesInfluenceInformationInputsLoopsManipulationOpinionsOutputPhotosProductProgramRepetitionScreenshotSearch engineSelectionSequenceSnippetsSoftwareStructuresVariablesVideoWebsite |