Australian Curriculum: Technologies: Digital Year 1 Term 2

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|  |  | Length: 8 weeks |
| Year level description | **Foundation to Year 2 Band Description** Learning in Digital Technologies builds on concepts, skills and processes developed in the Early Years Learning Framework. It focuses on developing foundational skills in computational thinking and an awareness of personal experiences using digital systems.  By the end of Year 2, students will have had opportunities to create a range of digital solutions through guided play and integrated learning, such as using robotic toys to navigate a map or recording science data with software applications.  In Foundation – Year 2, students begin to learn about common digital systems and patterns that exist within data they collect. Students organise, manipulate and present this data, including numerical, categorical, text, image, audio and video data, in creative ways to create meaning.  Students use the concept of abstraction when defining problems, to identify the most important information, such as the significant steps involved in making a sandwich. They begin to develop their design skills by conceptualising algorithms as a sequence of steps for carrying out instructions, such as identifying steps in a process or controlling robotic devices.  Students describe how information systems meet information, communication and/or recreational needs.  Through discussion with teachers, students learn to apply safe and ethical practices to protect themselves and others as they interact online for learning and communicating.  Learning in [Digital Technologies](http://www.australiancurriculum.edu.au/Glossary?a=T&t=Digital%20technologies) builds on concepts, skills and processes developed in the Early Years Learning Framework. It focuses on developing foundational skills in [computational thinking](http://www.australiancurriculum.edu.au/Glossary?a=T&t=Computational%20thinking) and an awareness of personal experiences using [digital systems](http://www.australiancurriculum.edu.au/Glossary?a=T&t=Digital%20systems).  By the end of Year 2, students will have had opportunities to create a range of [digital solutions](http://www.australiancurriculum.edu.au/Glossary?a=T&t=Digital%20solutions) through guided [play](http://www.australiancurriculum.edu.au/Glossary?a=T&t=Play)...  Read full description | |
| Achievement standard | By the end of Year 2, students describe the purpose of familiar products, services and environments and how they meet a range of present needs. They list the features of technologies that influence design decisions and identify how digital systems are used.  Students identify needs, opportunities or problems and describe them. They collect, sort and display familiar data from a range of sources and recognise patterns in data. Students record design ideas using techniques including labelled drawings, lists and sequenced instructions. They design solutions to simple problems using a sequence of steps and decisions. With guidance, students produce designed solutions for each of the prescribed technologies contexts. Students evaluate their ideas, information and solutions on the basis of personal preferences and provided criteria including care for the environment. They safely create solutions and communicate ideas and information face-to-face and online. | |
| Content Descriptors | Recognise and explore digital systems (hardware and software components) for a purpose [(ACTDIK001](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK001)) | |
| General Capabilities | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Screen Clipping  Literacy | Screen Clipping  Numeracy | Screen Clipping  ICT | Screen Clipping  Critical and Creative Thinking | Screen Clipping  Personal and Social | Screen Clipping  Ethical Understanding | Screen Clipping  Intercultural Understanding | |  |  | ***Managing and operating ICT***  Select and use hardware and software  Understand ICT systems  ***Creating with ICT***  Generate solutions to challenges and learning area task | ***Inquiring – identifying, exploring and organising information and ideas***  Organise and process information  Identify and clarify information and ideas  ***Generating ideas, possibilities and actions***  Imagine possibilities and connect ideas  ***Reflecting on thinking and processes***  **Transfer knowledge into new contexts** |  |  |  | | |

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| Week | Learning & teaching strategies | Assessment | Resources |
| 1 | |  | | --- | | **CHAPTER 1: BORED** (read the chapter to students)  **Learning activity:** What is a computer?  **Information for teachers:** *“Computers are built with hardware and software. The electrical or mechanical parts of a computer are called hardware. The instructions and the programs inside the computer are called software. Hardware and software work together to run a computer”(p.51).*    **Teacher:** Hold up p. 53. Teacher says: “Ruby’s new friends have different families. Mouse belongs to hardware, whereas Curser is software. They work great together. Look at the pictures, which one are hardware? Which ones are software? And which ones belong together?”(p.53).    **Teacher:** Hold up p. 54. Teachers says: “Computers are everywhere. You probably have more than a hundred computers at home. Which of these objects are computers? Which ones are not? “(p.54). | | |  | | --- | |  | | |  | | --- | | Hello Ruby: Journey inside a computer picture book | |
| 2 and 3 | |  | | --- | | **CHAPTER 2: DAD’S COMPUTER** (read the chapter to students)    **Learning activity:** What are computers used for?  Information for teachers: “Computers might look like they are doing complicated things, but all they do is a huge number of simple calculations one after another very fast. Computers don’t come up with solutions on their own: They need instructions to follow. People, on the other hand, can think creatively and independently. That’s why the tow make such a great team” (p.55).    **Teacher:** Take students to the computer room and hold up/show the following computer parts: keyboard, mouse, monitor, and computer. Show students the computer which is under the desks and then show them the teacher’s computer which has the computer built into the back of the monitor. Unplug the mouse/keyboard and show students how to reconnect them. Demonstrate that the mouse/keyboard do not work if they aren’t connected to the computer. Unplug the power supply to the computer, show students how to connect it, again demonstrate that without power the computer will not work.    **Teacher instruction:** Let students know that they are going to make their own computer out of cardboard and recycled materials. They need to use the keyboard BLM as a guide and think about how big they might make a monitor to go with the computer. How big/small will they make the mouse so that is it in relative size compared to the key board? What does their mouse need to connect to? What does their keyboard need to connect to? What about the monitor? Where will their power supply cable be?  **Student task:** Make your own computer.  **Student reflection:** Computers and humans are good at different things. Compare yourself to your computer (p.57). | | |  | | --- | | This could be an assessment if you choose | | |  | | --- | | Hello Ruby: Journey inside a computer picture book  A4 computer keyboard PDF, one for each student  Cardboard, recycled materials, string, paper etc.  Sticky tape, glue, scissors etc. | |
| 4 | |  |  | | --- | --- | | **CHAPTER 3: ELECTRICITY AND BITS** (read the chapter to students)  **Learning activity:** Input or output?  **Information for teachers:** *“The four big elements that make up a computer are the input, the processing, the output and the storage. Taking in data from the outside world is called input. This can be don withe input devices such as a keyboard. Another way to get input is with sensors. The data is then processed, which means that it’s modified in some way. This is done by a component called the processor, according to the instructions from the memory. The output shows the results – or example, letters on a screen. The whole process is called input/output process, or 1/0)” (p.59).*  **Teacher to say:** “Ruby falls inside the computer, but usually the only thing computers take in is data. When you type on a computer, the computer gets an input. Then the data is processed and the output shows the result on the screen” (p.59).    **Teacher:** Hold up page 61. Discuss with students which of the devices are for input? Which ones are for output? Note: At least one device a can be both.  **Teacher instruction:** Tell students that a keyboard is an input device that is used to type text, numbers and instructions for the computer. Show students Keys of a Keyboard pdf. Talk about the different functions of the keys. For example, the letter and number keys are used to display text. However, the enter key can tell the computer to select a particular item or the space bar key is used to enter a blank space between words. Distribute Hello Ruby Keyboard PDF (<https://hello-ruby-production.s3.amazonaws.com/uploads/exercise_material/attachment/13/keyboard.pdf> ) to each student.    **Student task:** As a class, each student needs to find and write on the following: space, Caps Lock, shift, enter and numbers 0-9. Then ask students, what if you could design a new key? There are a few empty keys on the keyboard. Can they design their own key? What does their button do?  **Information for teachers:** A computer is an electronic device which is capable of receiving information (data) in a particular form and performing a sequence of operations in accordance with a predetermined program to produce a result in the form of information or signals. Therefore, a smoke alarm and a microwave are computers.    **Teacher instruction:** Ask students, when the input is the letter is being pressed, what is the output? What happens when the input is the space bar, what is the output? Hold up page 54. Ask students if they can remember which ones were computers and which ones were not computers. Ask students if they think a smoke alarm is a computer? Once they’d determined that it is, ask them to think about the input. What will set off a smoke alarm? Then, what is the output? What does the fire alarm then do? What about a microwave, a mobile phone or a TV. Have a similar discussion. |  | | |  | | --- | |  | | |  | | --- | | Hello Ruby: Journey inside a computer picture book  Keys of a Keyboard pdf A3 size <https://hello-ruby-production.s3.amazonaws.com/uploads/exercise_material/attachment/13/keyboard.pdf>  A fire alarm, microwave, phone, TV to look at, to add input and view output | |
| 5 and 6 | |  | | --- | | **CHAPTER 4:** **LOGIC GATES** (read the chapter to students)  **Information for teachers:** “Electricity is the flow of electrons around a circuit. When you turn on the computer, electricity flows into the chips. If there is no electricity in the bit, the bit is OFF. When electricity is present, then the bit is ON. Binary is a word we use to describe being in a state of one of two conditions. Computer scientists use the numbers one and zero. In logic, it is called true or false” (p.80).  **Teacher to say:** “The first thing Ruby ran into inside the comptuer were bits. Inside a computer… everything is simply a bunch of switches that are On or Off. These are called bits” (p.80). Now we are going to think like a computer.  Teacher: Hold up page 85. Say, “the logic gates are quite the puzzlers. Help Ruby solve which ones are lying” (p.85). Then hold up page 86.  **CHAPTER 5: COMPUTER ARCHITECTURE** (read the chapter to students) As you read the chapters to students, record on the whiteboard of the friends she meets along the way (Mr CPU, GPU, RAM AND mass storage)  **Learning activity:** What are the main parts inside a computer?    **Student task:** Ask student to think about what the inside of a computer might look like. As students to draw what they think it might look like. Can they use words/write their thoughts? How does it function?  **Teacher to say:** Inside the computer there are lots of small electronic components. Each component has a special role. Look at the list of friends Ruby met on the whiteboard. Hand out a copy of Hello Ruby Who Lives Inside a Computer worksheet and as a class connect the dots and talk about the character’s functions.    **Guest speaker:** Invite Ms Villis to bring computer parts to show students. Students will be able to see and touch a motherboard, CPU, GPU, RAM and storage.    **Student task:** Make a laptop. Give students an A4 piece of card folded in half. The top half will be the monitor and the bottom half the computer (motherboard with components stuck on). Students need to cut the component of the computer and glue them in the correct places. They can then decorate the screen with the operating system, files and the stickers. | | |  | | --- | |  | | |  | | --- | | Hello Ruby: Journey inside a computer picture book  Hello Ruby Who Lives Inside a Computer worksheet  Guest speaker: Ms Villis who will bring comptuer parts to show students  Hello Ruby Parts Inside a computer PDF A3 size for each student  A4 card, folded in half | |
| 7 | |  | | --- | | **CHAPTER 6:** **SOFTWARE** (read the chapter to students)  **Information for teachers:** “The operating system (OS) is like a traffic cop. It passes instructions between the software and the hardware, handles memory, and makes sure things happen seamlessly. The operating system also manages all the applications. Applications are usually designed specifically for each operating system. Operating systems often use symbols like files and folders to help you use your computer, but some operating systems are text based. Operating systems make using a computer simple. Without an operating system we weould need to talk in the computer’s own languages of zeros and one” (p.76). “Different operating systems share a lot of things. Students are going to build an operating system for a phone.  **Teacher to say:** “When Ruby moves to the operating system, things start to look familiar. All computers have an operating system that makes it easy to use the computer” (p.76). Today you are going to build an operating system for a phone.    **Teacher:** As a class brainstorm the different features and functions of a phone. For example, icons on the home screen, applications (app), and camera function etc. Then give students a copy of Hello Ruby Phone Template showing the home view and app view. Ask students to think about what kind of apps they’d like their phone to have? What background would they like? How is their phone going to take pictures? How would you view the pictures? Does your phone have emoji? | | |  | | --- | |  | | |  | | --- | | Hello Ruby: Journey inside a computer picture book  Hello Ruby Phone Template PDF (I would enlarge the home view to A4 size and do the same for the app view) for each student  <https://hello-ruby-production.s3.amazonaws.com/uploads/exercise_material/attachment/16/operatingystem-en.pdf> | |
| 8 | |  | | --- | | **CHAPTER 7:** **TROUBLESHOOT** (read the chapter to students)  **Information for teachers:** “Modern computers are examples of collaboarative creavitity: Engineers, electronics experts, psychologisits, physicits, material scientisits, and many other professions needed to come together to create the computer- there is no one father or mother. Computers are still in their infancy and it’s up to all of us to help them grow by using them as enablers of creativity. Every profession will benefit from being familiar with and unafraid of computers” (p.88).    **Student task:** Pretend you are an app designer. What kind of app would you like to design? Firstly, think about what kind of problems an app can help solve. Who could the app help? A game designer, Mum, astronaut, chef, detective, you etc. Ask students to design their app icon. In a sentence or two, describe the app. What will the screen look like on a device when the app is opened? Draw a design. | | |  | | --- | | You could make this an assessment. Criteria could be that the app has a purpose. | | |  | | --- | | Hello Ruby: Adventures in coding picture book | |