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PRIMARY LANGUAGE CURRICULUM ENGLISH

Internet research and inquiry cycle

LEARNING OUTCOMES

This guide supports the teaching of all languages and is relevant to all learning outcomes across the three strands.

- Oral Language/Teanga ó Bhéal
- Reading/Léitheoireacht
- Writing/Scríbhneoireacht

Internet research and inquiry cycle

The Internet and other digital technologies offer a range of multimodal supports to scaffold children's learning. We need to develop instructional contexts in classrooms that integrate digital technologies and the Internet in meaningful ways to support children to develop the key skills, strategies, dispositions and social practices necessary to live and learn in the 21st century.

Research suggests that many children are struggling to utilise the Internet and other digital technologies in complex online environments for academic purposes (Bennett, Matton, & Kervin, 2008; Ito et al., 2009). Finding information on the Internet involves a complex orchestration of a repertoire of skills, strategies, dispositions and social practices in both online reading comprehension and information-seeking skills. Overt modelling by the teacher and explicit instruction in both of these areas is necessary to ensure that all children have the competencies required to utilise the Internet and other digital technologies for academic purposes.

Digital Literacy can be described as a complex orchestration of a range of skills, strategies, dispositions and social practices to leverage technology to access, acquire, comprehend, analyse, evaluate, synthesise, create and communicate knowledge in multiple modes and in multiple representations to and with a variety of audiences and in a variety of contexts for a range of purposes. [Drawing on definition of digital literacy in NCCA, 2019, p. 50]. Key stages in the recursive, iterative, interlinked, and opportunistic Internet inquiry and research cycle (shown in Figure 2) include forming goals and asking questions, generating search terms, investigating search results, locating and critically evaluating information, and summarising, synthesising and communicating information.

Internet research and inquiry cycle

Comprehension skills and strategies	include activating prior knowledge, making connections, asking questions, making inferences, monitoring understanding, determining important ideas, evaluating, summarising, synthesising, and communicating.
Key dispositions and habits of mind	involve self-regulation, curiosity, resilience, self-efficacy, persistence, intrinsic motivation and an ability to set learner-centred goals.
Inquiry based learning during Internet research	places children's curiosity at the centre of the learning experience. It involves children in structured cross-disciplinary inquiries often based on diverse, compelling, authentic real world issues. Children pose questions, investigate, wonder, design solutions in collaboration with others, build and act on new understanding and knowledge and reflect on new conceptual knowledge within a community of learners involving both teachers and children.
Social practices	include the ability to collaborate with others, support each other's thinking, problem solve, participate, create and apply solutions in creative and reflective ways. Children should work collaboratively to stop, think and talk to discuss and share ideas and 'aha' moments, and reflect on the processes and product of their Internet inquiry and research.

Table 1. Internet research and inquiry: Key skills, strategies, dispositions and social practices (3SD)

Research (Dwyer, 2010) suggests that peer-to-peer collaboration in an online environment does not always occur spontaneously and so structures need to be put in place to encourage children to share and exchange ideas, insights and strategies. Reciprocal Teaching (Palinscar & Brown, 1984) is a well-researched and validated instructional model. Following teacher-led dialogue and explicit strategy instruction, using the gradual release of responsibility model, the children take turns in leading the dialogue centred on one of the reciprocal roles of questioning, predicting, clarifying, and summarising. In an online environment, reciprocal roles could include children taking on the roles of Questioner, Navigator and Summariser (Dwyer, 2010).

PRIMARY LANGUAGE CURRICULUM
ENGLISH

Internet research and inquiry cycle

The Questioner as a team leader	The Navigator	The Summariser
plans the strategy, guides the group to create deeper level questions to focus online inquiry; leads the group to reflect on the effectiveness of the search strategy when the task is finished.	ensures the group pilots their way across multiple websites effectively and efficiently; concurrently monitors suggested cues on the search result screen and investigates the clues provided in the abstract blurb and URL and matches both to the focus of inquiry.	ensures that the group critically evaluates the trustworthiness of the information generated by the inquiry by cross-checking at least two other sources of information; encourages the group to monitor and clarify difficult vocabulary; guides the group in encapsulating and summarising the information generated by the Internet inquiry (Dwyer & Harrison, 2018).

These roles are temporary and interchangeable scaffolds to support children as they develop these strategies and internalise these skills.

Table 2. Online Reciprocal Roles: Questioner, Navigator, Summariser
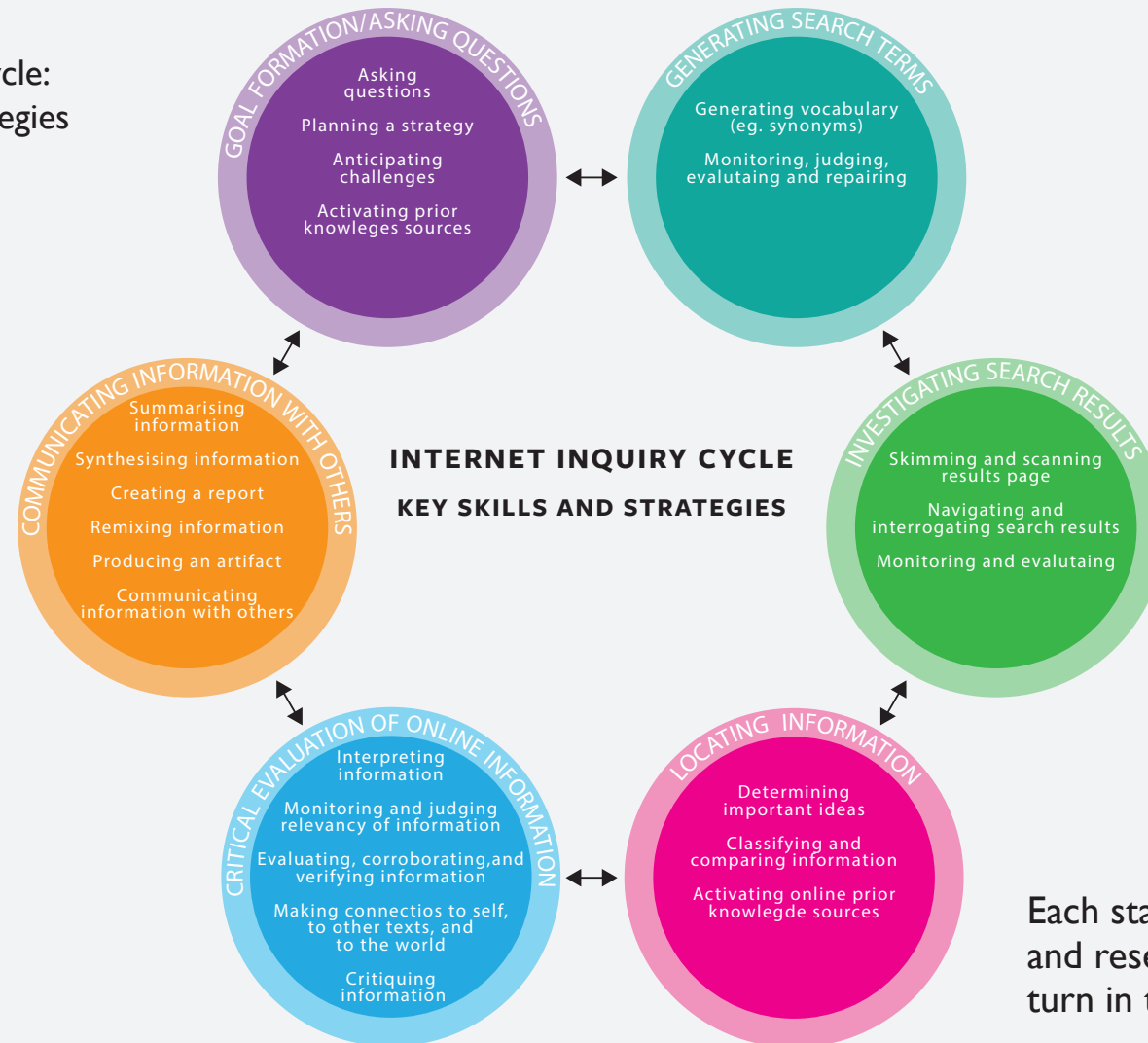
Internet research and inquiry cycle

Questioner ?	Navigator 🧭	Summariser 🔄
What are we trying to find out today?	What are we trying to find out today? Which link will we follow? Will we search either/ and by text, image, or video?	What's the most important information here?
What questions do we have?	Will we read the blurb under each search result?	How reliable is this information? How do we know it's trustworthy?
What key words will we choose for our search terms?	What does the search result tell us about the source of the information?	Will we cross-check the information on other websites
Can we discuss the relevance of the information to our task today?	Will we scroll down the page?	What would we tell a friend about what we have learned?

Figure 1. Children's Prompt Cards for Online Reciprocal Roles (Dwyer, 2010)

PRIMARY LANGUAGE CURRICULUM
ENGLISH

Internet research and inquiry cycle

Figure 2.
Internet Inquiry Cycle:
Key Skills and Strategies

GOAL FORMATION/ASKING QUESTIONS

Asking questions

Planning a strategy

Anticipating challenges

Activating prior knowleges sources

GENERATING SEARCH TERMS

Generating vocabulary (eg. synonyms)

Monitoring, judging, evalutaing and repairing

INVESTIGATING SEARCH RESULTS

Skimming and scanning results page

Navigating and interrogating search results

Monitoring and evalutaing

INTERNET INQUIRY CYCLE

KEY SKILLS AND STRATEGIES

LOCATING INFORMATION

Determining important ideas

Classifying and comparing information

Activating online prior knowlegde sources

CRITICAL EVALUATION OF ONLINE INFORMATION

Interpreting information

Monitoring and judging relevancy of information

Evaluating, corroborating, and verifying information

Making connectios to self, to other texts, and to the world

Critiquing information

COMMUNICATING INFORMATION WITH OTHERS

Summarising information

Synthesising information

Creating a report

Remixing information

Producing an artifact

Communicating information with others

Each stage of the Internet inquiry and research cycle is considered in turn in the sections which follow.

PRIMARY LANGUAGE CURRICULUM
ENGLISH

Internet research and inquiry cycle

Forming goals and asking questions

GOAL FORMATION/ASKING QUESTIONS

Asking questions

Planning a strategy

Anticipating challenges

Activating prior knowleges sources

Few of us engage in online inquiry in a planful manner. This lack of planning often results in that feeling of disorientation and frustration experienced during online inquiry and research when we struggle to find information related to our questions.

For purposeful reading and inquiry on the Internet it is important that children formulate engaging questions to provide a purpose for their inquiry, set a context for problem solving, and establish a goal for learning (Castek & Dwyer, 2018). Creating an authentic inquiry-based learning opportunity, or setting a purpose or task, based for example, on the lived experiences of children in their communities, on a real world global issue, on a field trip, or expert visit builds situational interest which can spark children's engagement, motivation, curiosity, and civic engagement.

Usually it is the teacher who asks questions in the classroom so asking children to generate their own questions can, initially, be challenging. Encouraging children to dig deeper with their questions, asking why, what if, how or I wonder questions, can be modelled by the teacher.
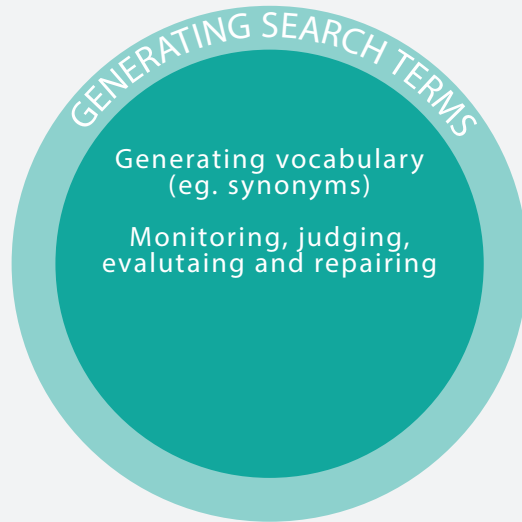
Additionally, children could collaborate in pairs to formulate and post questions on an online share board using a digital tool like Padlet (https://padlet.com/). Again having an audience of their peers will encourage the children to pose more challenging questions.

primary
developments
foráis sa bhunscolaíocht

PRIMARY LANGUAGE CURRICULUM
ENGLISH
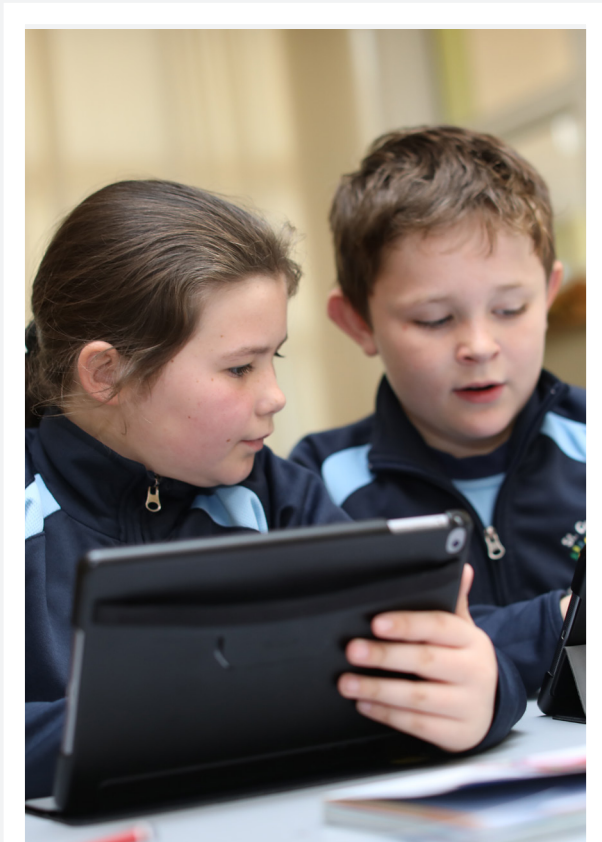
Internet research and inquiry cycle

Generating search terms

GENERATING SEARCH TERMS

Generating vocabulary (eg. synonyms)

Monitoring, judging, evalutaing and repairing

Children need to be able to monitor, judge, evaluate, and revise search terms. Insufficient vocabulary knowledge related to the topic and the inability to generate synonyms for key word searches can hamper an online inquiry. Generating search terms for Internet inquiry by typing text or voice search involves the Goldilocks Principle; are

the search terms too narrow, too broad or just right? Key words related to the search task can be sourced by skimming and scanning the search result screen for suggestions in the blurb or in other keywords suggested by the search engine on the result screen.

Investigating search results

INVESTIGATING SEARCH RESULTS

Skimming and scanning results page

Navigating and interrogating search results

Monitoring and evalutaing
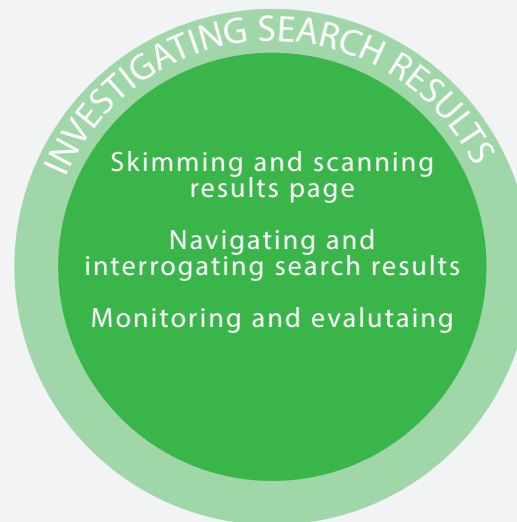
Children need to be able to navigate, interrogate and evaluate search results speedily, effectively and with a critical eye. Research suggests that children rarely go beyond the first or second result returned. Children need to adopt an inquiring, questioning stance when investigating search results, critiquing the information provided by the URL and blurb as to the reliability and source of the information and the relevance to the task at hand.

PRIMARY LANGUAGE CURRICULUM
ENGLISH

Internet research and inquiry cycle

Locating information

LOCATING INFORMATION

Determining important ideas

Classifying and comparing information

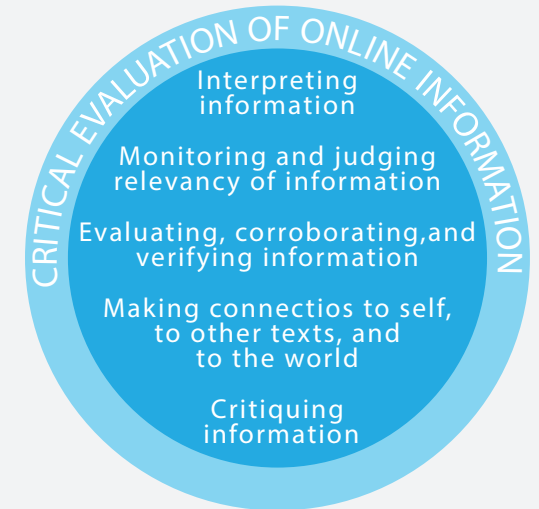Activating online prior knowlegde sources

When students have poorly developed skills on the processes of generating search terms and investigating search results they have little cognitive energy to locate information or develop conceptual knowledge related to the topic at hand. Locating information involves navigating speedily and efficiently across a myriad of websites, skimming and scanning for relevant and important information and building and updating knowledge on-the-hoof in the malleable moments of an online search. Dispositions and mind-sets, such as curiosity, resilience, self-efficacy (self-belief, motivation, and engagement), doggedness, persistence, and flexibility are needed to avoid the cognitive overload often experienced by online readers.

Critical evaluation of online information

CRITICAL EVALUATION OF ONLINE INFORMATION

Interpreting information

Monitoring and judging relevancy of information

Evaluating, corroborating,and verifying information

Making connectios to self, to other texts, and to the world

Critiquing information

The Internet is a largely unvetted open source media where literally anyone can post any information. Research suggests that children have difficulties in realising that incorrect or false information can be posted on the web and are often mislead by the appearance of a website. Critical thinking skills, critical reading

Internet research and inquiry cycle

skills, critical multimodal information literacy skills, and critical literacy skills are needed to frame, evaluate, corroborate, and interrogate the reliability and veracity of the information presented online. The online reader must "read with and against the text" (Janks, 2019, p. 561) to raise their antennae about how the text is built and how the text defines the world. In addition, the online reader should interrogate the perspectives presented in the text; the author stance (what the author has presented and omitted to present), and analyse the discourse presented in the text with regard to gender, power and social issues.

Critical evaluation of online information may be developmental by nature. Children are drawing on limited prior experience and world knowledge (often referred to as common sense knowledge) to assess and evaluate online information. Children need to develop a questioning stance and a healthy scepticism towards online information.

Communicating information with others
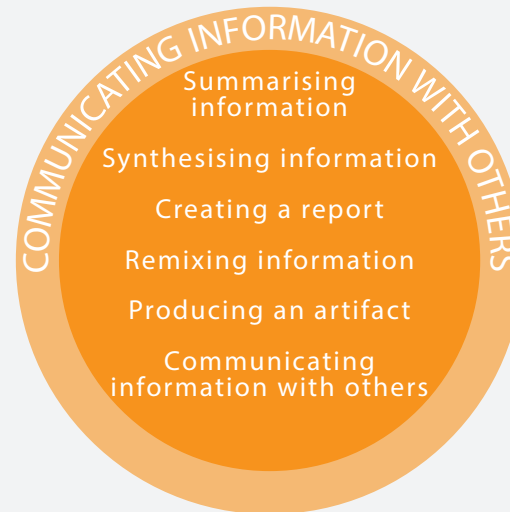
Summarisation and synthesising information are compounded in an online environment as children need to be able to deal with an information overload as they navigate across a multitude of websites and in multiple modes (audio, video, text, image) to sift, determine importance, condense, and transform information. Children can represent their learning and conceptual knowledge through multiple means of representation using a range of digital tools to apply their knowledge in new and creative ways. It is important that children reflect on both the processes of online inquiry and the product of that inquiry. In addition, it is important for children to reflect on the collaborative processes and the decisions made during online research within the community of learners in classrooms.

PRIMARY LANGUAGE CURRICULUM

ENGLISH

Internet research and inquiry cycle

Assessment of current skills

In order to support children during Internet inquiry and research, teachers need to assess their current capabilities in relation to key Internet inquiry stages and skills listed in Figure 2 (Dwyer, 2016). Teachers can record children online activity using an online screen capture tool like Screencast-o-matic (www.screencast-o-matic.com). Based on analysis of the children's online activity and indeed real time physical observation of that activity, teachers can determine the current strengths and needs of the children with regard to the Internet research and inquiry cycle and plan explicit instruction accordingly to support children's online inquiries.

primary developments
foráis sa bhunscolaíocht

PRIMARY LANGUAGE CURRICULUM
ENGLISH

Internet research and inquiry cycle exemplar

Starting Out	Stepping Up	Moving On
Teacher and children decide on inquiry /topic based on an **authentic real world challenge:** Teacher chooses cross curricular and literacies foci (Digital, Disciplinary, Critical, Visual literacies)	Children build knowledge on inquiry or topic online, using video audio and image resources, and through print based materials Children expand knowledge of digital tools	Children represent new knowledge through multiple modes and means of representation to class peers or audience. Children work on design challenge
Teacher considers Learning Outcomes; pedagogical approaches, classroom organisation, children activities, use of a technology, AoL, AfL	Children work collaboratively to share ideas and 'aha' moments. Children adopt interchangeable online Reciprocal Roles of Questioner, Navigator, Summariser	Children reflect on learning Children reflect on collaborative process Children reflect on the use of digital tools
Teacher activates background knowledge, builds situational interest and develops vocabulary related to topic or inquiry through multiple modes (video, audio, and images) using digital technologies and print based materials.	Children develop skills and strategies to inquire, navigate, locate, connect, evaluate, summarise, synthesise with digital and literacy focus (e.g. disciplinary/critical/visual)	Children develop skills and strategies to justify, use, design, engineer, create, communicate, respond with digital and literacy focus (e.g. disciplinary/critical/visual)
Teacher scaffolds the development of literacies through demonstration, think alouds and modelling using the gradual release of responsibility model Direct instruction T- Chdn *	Guided Structured Practice Children are active, agentic, engaged T- Chdn; Chdn -T; Chdn - Chdn	Independent Practice Chdn - T; Chdn - Chdn
Dispositions and mind-sets: metacognition, wonderment, self-regulation, curiosity, resilience, self-efficacy, persistence, intrinsic motivation and engagement		
* T denotes 'Teacher', Chdn denotes 'Children'		

PRIMARY LANGUAGE CURRICULUM
ENGLISH

Internet research and inquiry cycle

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137