# Teaching and Learning Guidelines on the Use of Information and Communication Technology in Pre-School Centres

GUIDE

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### Organisations, Institutes of Higher Learning and Training Agencies

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PAP Community Foundation
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### Pre-School Centres

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Ramakrishna Mission Sarada Kindergarten

**This document outlines the three guiding principles on pre-school teachers' use of Information and Communication Technology (ICT) for children ages four to six. These three guiding principles are illustrated with examples of teaching practices in the local context which incorporate the use of ICT with children. The document is aligned to the belief, principles and learning goals stated in the Nurturing Early Learners (NEL) Framework.**

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# EXECUTIVE SUMMARY

The "Teaching and Learning Guidelines on the Use of Information and Communication Technology (ICT) in Pre-school Centres" supports teachers in planning, implementing and reviewing learning activities that make use of ICT. The *Guidelines* takes reference from the belief, principles and learning goals of the Nurturing Early Learners (NEL) Framework (MOE, 2012) and is written for teachers of children ages four to six. The *Guidelines* is also informed by research on the use of ICT in the teaching and learning of children, current trends in Early Childhood Education (ECE) as well as feedback from local pre-school practitioners, Institutes of Higher Learning, and Training Agencies.

## THE DEFINITION OF ICT IN THE *GUIDELINES* IS AS FOLLOWS:

**ICT encompasses any technology used by teachers and children in the ECE setting that handles information and has an interactive capacity.**

The three guiding principles in the *Guidelines* give broad directions to teachers if they use ICT in their teaching and learning. The three guiding principles are based on the understanding of how children learn and develop through **play** and **quality interactions.** When designing any activity that makes use of ICT, teachers should **consider all three guiding principles as a whole,** so that children's learning experiences with ICT are meaningful and appropriate.

The three guiding principles for teaching and learning with the use of ICT are:


## Elaborations on the Guiding Principles

**1.** Children learn best when they engage with concrete materials, participate in hands-on activities and have quality interactions with friends, teachers and parents.

**2.** When facilitating children's learning experiences with ICT, teachers should promote quality interactions, encourage play and exploration, and support children's construction of knowledge.

**3.** Teachers should adopt a measured approach in using ICT as there is clear evidence that inappropriate or excessive use of ICT can be detrimental to children's development.

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# INTRODUCTION

**"We recognise that technology is at the fore of change. Our educators must harness the possibilities that it brings to teaching and learning. Nevertheless, the heart of teaching and learning is not just about having more technology in the classroom. Our people – our dedicated teachers and visionary school leaders - are at the heart of effective teaching and learning."**

**Mr Ng Chee Meng**

Minister For Education (Schools)

5th International Conference on Teaching and Learning with Technology 2016

The "Teaching and Learning Guidelines on the Use of Information and Communication Technology (ICT) in Pre-school Centres" guides pre-school teachers in teaching and learning with the use of ICT for children ages four to six. It highlights the educational impact of teachers' use of ICT, and gives recommendations on how teachers can work closely with parents to ensure children's safety and well-being.

The *Guidelines* is based upon the belief and principles stated in the Nurturing Early Learners (NEL) Framework (MOE, 2012). It recognises the importance of children learning through play and quality interactions as mentioned in pages 34 and 36 in the NEL Framework.

When children **learn through play**, they find learning enjoyable and develop their imagination and creativity. Play can range from unstructured with free choice by children to being highly structured with teacher-led instruction and direction. In purposeful play, teachers intentionally plan the play experiences for children to construct knowledge of the world around them. Children are given the opportunity to initiate play and the flexibility to explore materials with their five senses. Through **quality interactions,** children are given opportunities to interact with friends, teachers and parents in ways that extend their thinking. Hence, **opportunities to learn through play and engage in quality interactions are fundamental to children's learning and development which the use of ICT should not replace.**

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# DEFINITION OF ICT

In ECE frameworks and literature, ICT is widely understood to include any electronic, digital device or system that changes the environment and the way in which daily routines and activities are carried out. Technologies such as the telephone, refrigerator, traffic lights and passenger information display systems have changed our daily routines, allowing for greater ease and efficiency in carrying out our daily activities. These technologies have also changed to varying degrees the way in which we interact with each other and the physical environment. Such technologies are widely recognised in the pre-school sector as useful tools in the teaching and learning of children. For example, teachers introduce these technologies in the classroom at the dramatic play learning centre where washing machines and cash registers are set up to support and enhance children's play.

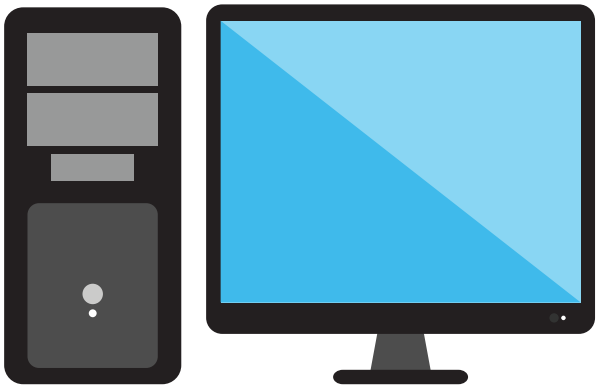
However, teachers may face challenges introducing certain ICT tools (e.g. touch tablets, interactive whiteboards and technology-enabled (tech) toys) and resources (e.g. applications, and software programmes) in meaningful and appropriate ways that promote children's holistic development and safeguard their safety and well-being.

Hence, the *Guidelines* seeks to support teachers in using such ICT tools and resources by defining ICT in this document as follows:

**ICT encompasses any technology used by teachers and children in the ECE setting that handles information and has an interactive capacity.**

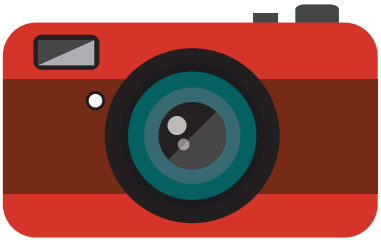
Such ICT tools and resources include devices and systems like the Internet that are available in children's environment as well as emerging technologies. They are used to access, gather, manipulate and present information for the purpose of communicating and interacting with others (Lloyd, 2005). In addition, children are able to create and design with greater ease due to the rapid evolvement of ICT tools and their uses. Hence, ICT tools and their uses have the potential to shape children's environment and the way they interact with their friends and family.

# EXAMPLES OF ICT TOOLS AND RESOURCES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

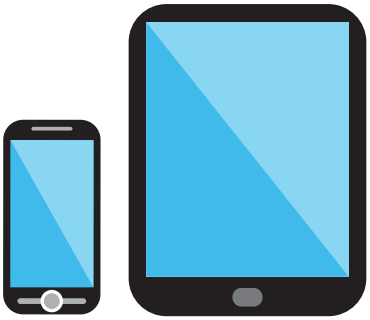


Computer hardware and software

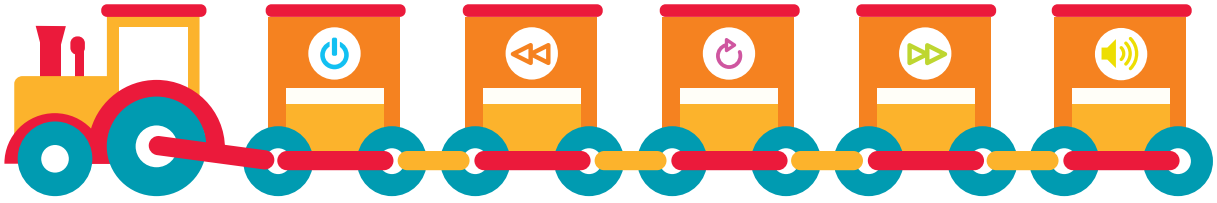
The Internet



Digital cameras



Communication devices



Technology-enabled (Tech) toys

These ICT tools should support children's learning and not be ends in themselves, i.e., they should not be used only as a novelty and a means to engage children.

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# GUIDING PRINCIPLES ON TEACHING AND LEARNING WITH THE USE OF ICT

The guiding principles support teachers in planning, implementing and reviewing learning activities that make use of ICT for children ages four to six. They have taken into consideration current research on the use of ICT in the early years as well as ECE frameworks and guidelines from different countries and regions. The guiding principles were developed taking reference from the belief and principles articulated in the NEL Framework.

For the guiding principles to be effectively applied to teaching and learning, teachers would need to bear in mind the following key considerations in the diagram below:

**Diagram 1: Key considerations upon which the guiding principles are based**

**The belief that children are curious, active and competent learners**

This is the belief that the NEL Framework (MOE, 2012) is based upon; it shapes teachers' classroom practices when they use ICT.

**The understanding that children learn through play – Play is the primary means through which children encounter and explore their environment**

The use of ICT should complement opportunities for children to learn through play. If ICT is used, it should not promote rote learning and learning through drills.

**The understanding that children learn through quality interactions**

There should be opportunities for quality interactions when using ICT, where children work together with others to investigate a topic, solve a problem, clarify a concept, or tell a story. Quality interactions optimise their learning and develop their cognitive and social-emotional skills (MOE, 2012).

The *Guidelines* has **three guiding principles** to support teachers in planning quality learning experiences where ICT is used. When designing any activity that makes use of ICT, teachers should **consider all three guiding principles as a whole,** so that children's learning experiences with ICT are meaningful and appropriate. The three guiding principles are:

**Diagram 2: Guiding principles for teaching and learning with the use of ICT**


The following sections elaborate on each of the guiding principles and provide examples to illustrate how the guiding principles may be enacted in the classroom.

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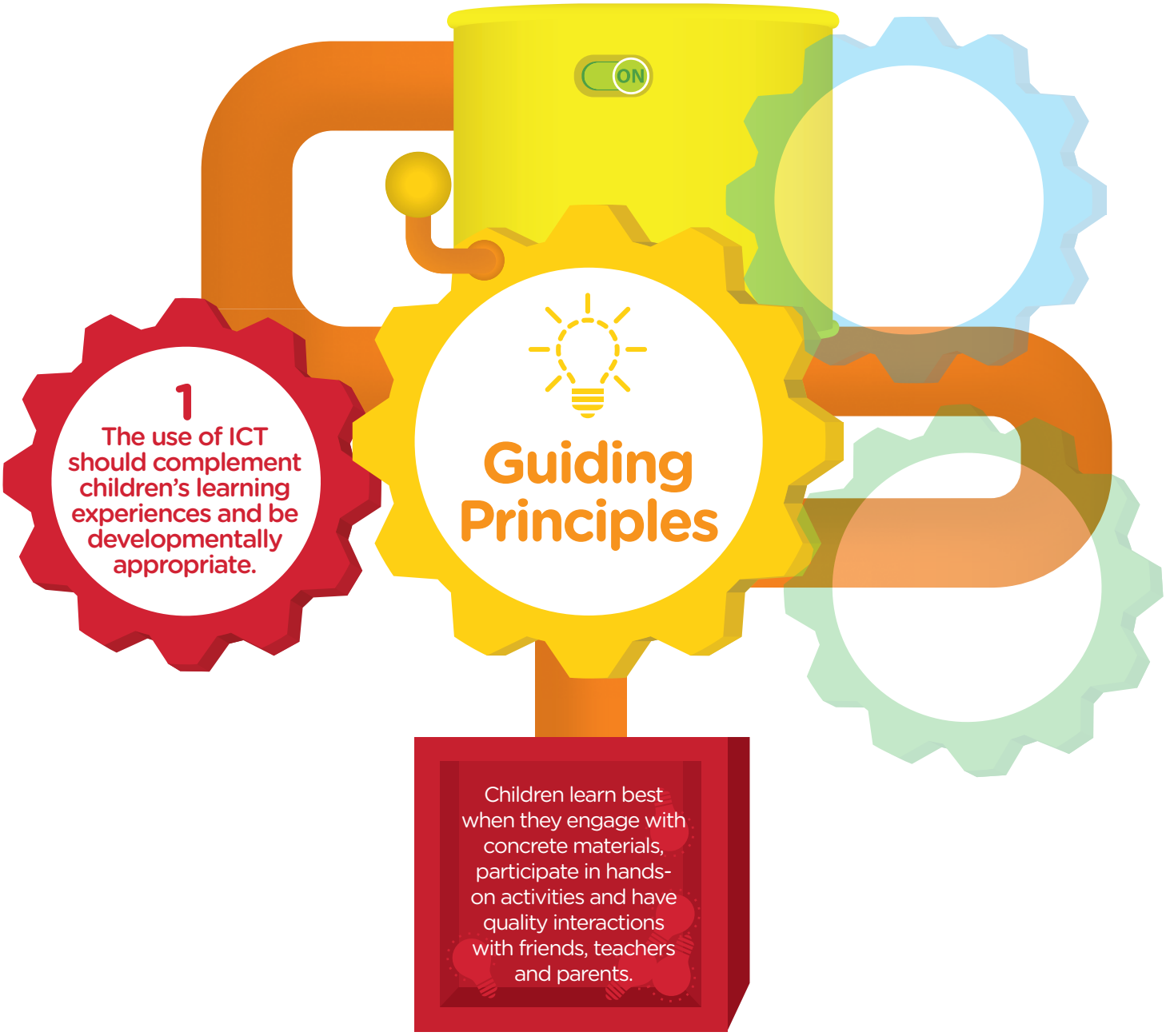
# GUIDING PRINCIPLE 1

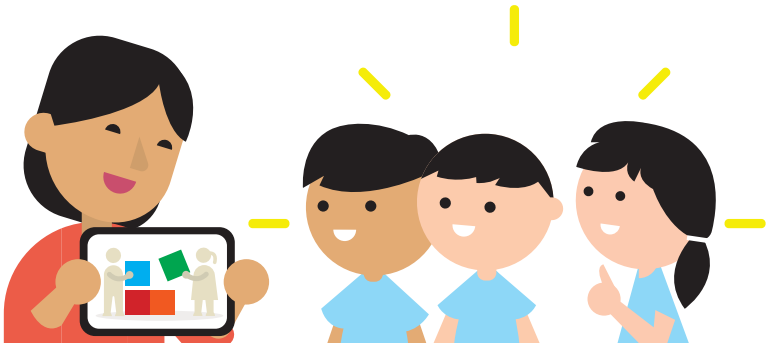



Learning through concrete and sensory experiences that promote quality interactions is essential to children's learning and development. Children make use of their five senses to explore their environment and share what they have discovered with others. They learn through interacting with objects, the physical environment and people in contexts that are real, relevant and meaningful to them (MOE, 2012). Children need sufficient time to share their thoughts, feelings and ideas with others through quality interactions that consist of shared and sustained conversations. Hence, the use of ICT should complement children's real-life exploration, outdoor activities, play and social interactions as this would have a positive impact on children's holistic development.

# COMPLEMENTING CHILDREN'S LEARNING EXPERIENCES WITH THE USE OF ICT

**The use of ICT can complement children's learning experiences when teachers ensure that:**

ICT use is **aligned to the learning objective(s)** of the activity



Children's **learning experiences are enhanced** through the use of ICT

When planning for children's learning experiences that make use of ICT, teachers need to consider **how the use of ICT will support children's learning and development through the activity's learning objectives.** Hence, teachers should not use ICT in teaching and learning to only entertain or occupy children. For example, a teacher's use of electronic-books (e-books) could achieve the learning objective of developing children's understanding of the story. While children had earlier read the physical book together, the teacher could use the e-book, with its added features, to enhance children's understanding of the story[1]. This would support children later in their dramatisation of the book's characters and events which would help deepen their understanding of the story.

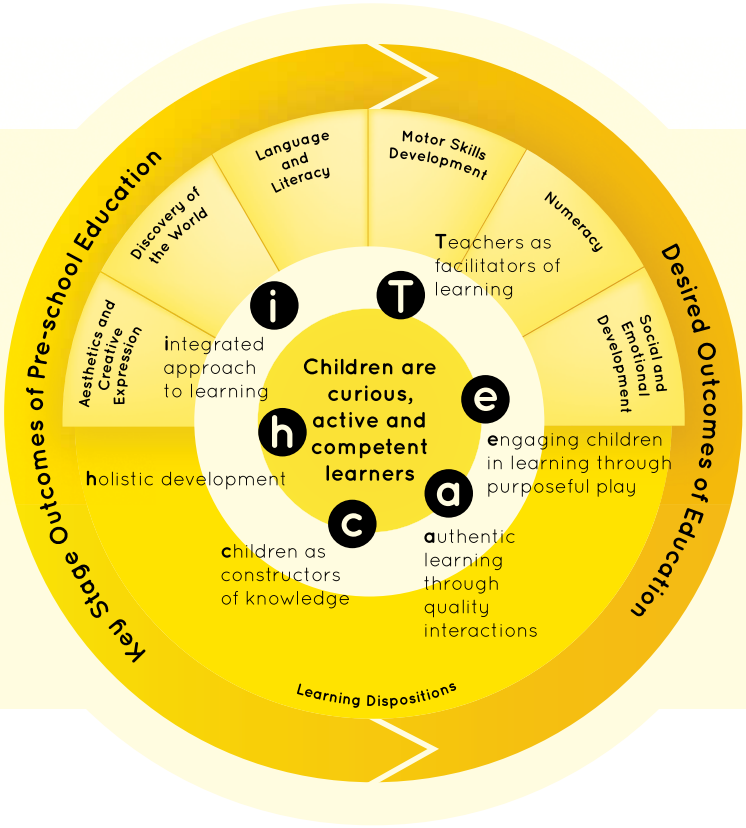
Teaching and learning with **the use of ICT should not replace children's experiences with concrete materials.** For example, there are programmes and applications that give children opportunities to practise tracing letters or characters. However, these ICT resources should not replace concrete materials and hands-on activities such as sand-tracing and clay moulding of letters or characters that teachers need to provide as part of children's learning experiences.

[1]Research has shown that e-books or technologically-enhanced stories can, to some extent, enhance children's understanding of the story and their spoken vocabulary. However, this benefit was experienced only with stories that had multimedia features (i.e. animated pictures, music and sound effects) and not those with interactive features (i.e. hotspots, games and dictionaries) (Takacs et al., 2015).

# DEVELOPMENTALLY APPROPRIATE USE OF ICT

Developmentally appropriate use of ICT should be premised on the belief, principles and learning goals of the NEL Framework. The diagram below gives an overview of the NEL Framework which guides the pre-school sector in developing quality learning experiences for children:

**Diagram 3: Overview of the NEL Framework**



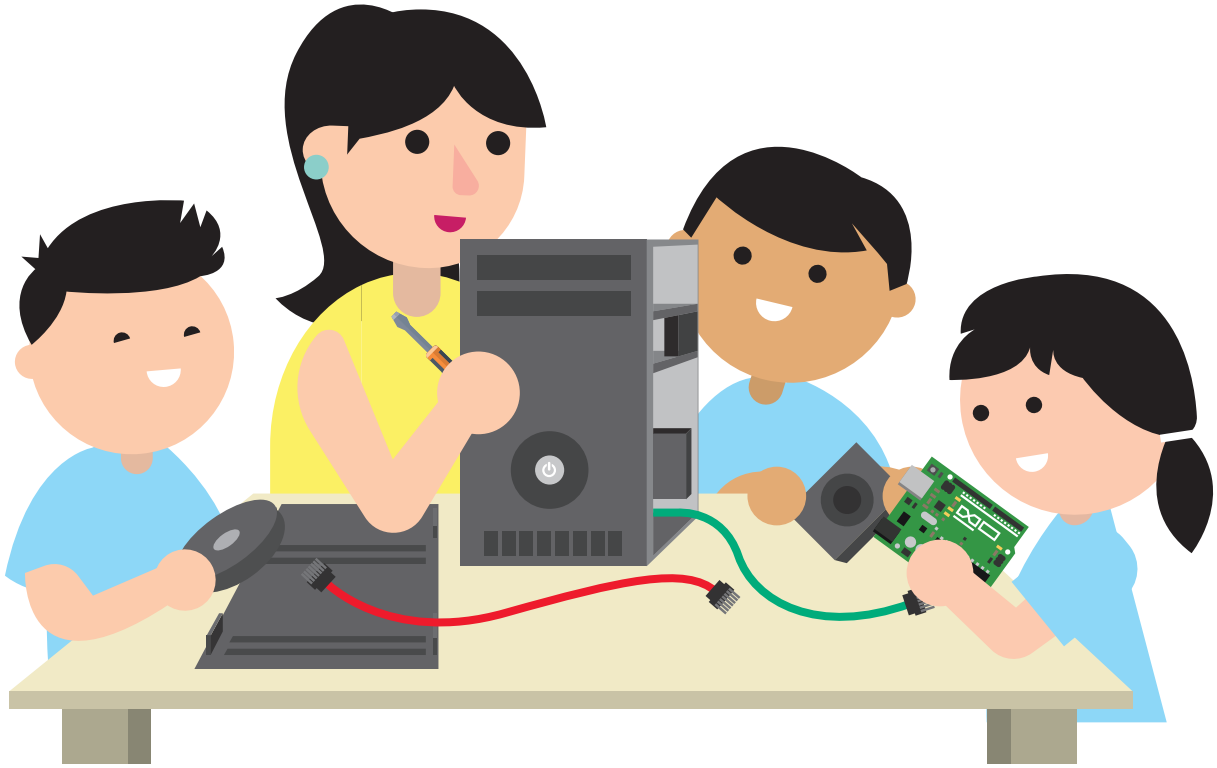

MOE 2012, p.25

At the centre of the Framework is the belief that children are curious, active and competent learners. The Framework advocates iTeach, an acronym for the six principles which guide teaching and learning in a quality curriculum. The Framework lays the foundation for children's learning and development by helping them to acquire the knowledge and skills in the six learning areas, and develop positive dispositions towards learning through PRAISE (**P**erseverance, **R**eflectiveness, **A**ppreciation, **I**nventiveness, **S**ense of wonder and curiosity, **E**ngagement).

An example of developmentally appropriate ICT use would be when activities are planned with the belief of the NEL Framework in mind. For example, when teachers believe children are curious, active and competent learners, they may use ICT to facilitate and encourage play and exploration. In using ICT, they are mindful to **provide open-ended learning experiences and encourage social interaction and collaboration between children.**

To provide children with open-ended learning experiences in ICT, teachers can select applications, software or tech toys that **give options and choices to children** to explore and experiment; to be creative and to use their imagination. In contrast, ICT tools and resources which allow children to arrive at solutions by simply progressively eliminating the incorrect responses do not encourage children to be active and curious (Siraj-Blatchford & Siraj-Blatchford, 2000).

Teachers who believe children are curious, active and competent learners, provide opportunities for them to interact and collaborate with their friends. Such



**Finding out how things work through exploration**

experiences make learning enjoyable and provide many opportunities for social and emotional development as children learn to take risks, make mistakes, cope with failures and encourage each other (MOE, 2012). When planning for children's learning experiences with ICT, teachers can consider opportunities where children **share an ICT tool or resource in pairs or groups.** In such an experience, children can decide amongst themselves, at times with the support of the teacher, what roles they would like to take on. For example, children as a group can decide upon which specific function of the ICT tool or resource should be controlled by which member of the group, thus developing their decision-making and turn-taking skills. In addition, teachers need to **create a positive learning environment where children can make mistakes and seek help** from each other or their teacher when encountering difficulties in using the ICT tool (Tran & Subrahmanyan, 2013). One way that teachers can create a positive learning environment is to give opportunities to children to share their learning experiences using ICT with their friends. This sharing should be facilitated by the teacher so that children's efforts and perseverance in using ICT are affirmed and not just their successes. This will develop in children a "growth mindset" where they will be keen to stretch their abilities and persevere even when faced with difficulty (Dweck, 2006).

**Example 1 below shows how teaching practice could take reference from guiding principle 1:**

# Children video-recording themselves sharing about local food

The children were exploring the topic of local food. Their Chinese teacher had observed how confident and animated the children were when they spoke about their favourite food. She used this knowledge to develop their confidence in speaking Mandarin[2] by suggesting that children produce a video-recording in which children talked about and shared their favourite local food with their friends. This prompted the children to plan their presentations and video-record them with the teacher's support. The final video clips were then made available for sharing and discussion with their family.

**Discussing about their favourite local food**

[2]Developing children's confidence in speaking Mandarin is aligned with Learning Goal 2 "Develop Foundational Language and Literacy Skills" in the NEL Framework for Mother Tongue Languages (MOE, 2013, pg.30).

# How the video-recording complemented children's learning experiences

Presenting their favourite food in class

The video-recordings complemented children's learning experiences in developing their confidence in speaking Mandarin by enhancing their learning experience. Throughout the process, since children could view the video-recordings, they were observed to be motivated to practise several times to improve on their presentation.

The video-recordings also enhanced children's learning experiences by giving them an opportunity to reflect on their presentation together with their friends. The teacher facilitated children's viewing of their video-recordings and supported them in coming up with ways to improve their presentation. This included presenting with a smile, standing confidently with less fidgeting and possibly giving more details (e.g. sharing something about their favourite food that their friends may not know).

Another enhancement to children's learning experiences was that the video-recording could be shared with the children's families. This helped children's parents to gain a better understanding of how their child had developed confidence in speaking Mandarin. The families could then further extend opportunities for children to speak Mandarin, creating a more supportive environment for their learning.

Recording the interview

# How the video-recording was used in developmentally appropriate ways

One way in which the activity is developmentally appropriate can be seen in the teacher's use of the video-recordings. She applied the specific iTeach principle of engaging children in "**a**uthentic learning through quality interactions", by making the focus of the video-recordings the children's favourite local food. This was a topic that was relatable and relevant to their daily lives.

During the video-recording, children were engaged in quality interactions with their friends and teacher as they worked in small groups. They had to negotiate taking turns and decide on their roles, such as who would do the filming; who would be the interviewer and who would be interviewed, etc. As the children played back the video and reflected on their presentation, they discussed, with the teacher's facilitation, how they could make their presentation better. In addition, when viewing the final product, the teacher gave the children opportunities to ask questions to find out more from the child who was presenting. This afforded the children and the teacher to engage in quality interactions over shared and sustained conversations.

Reviewing the video

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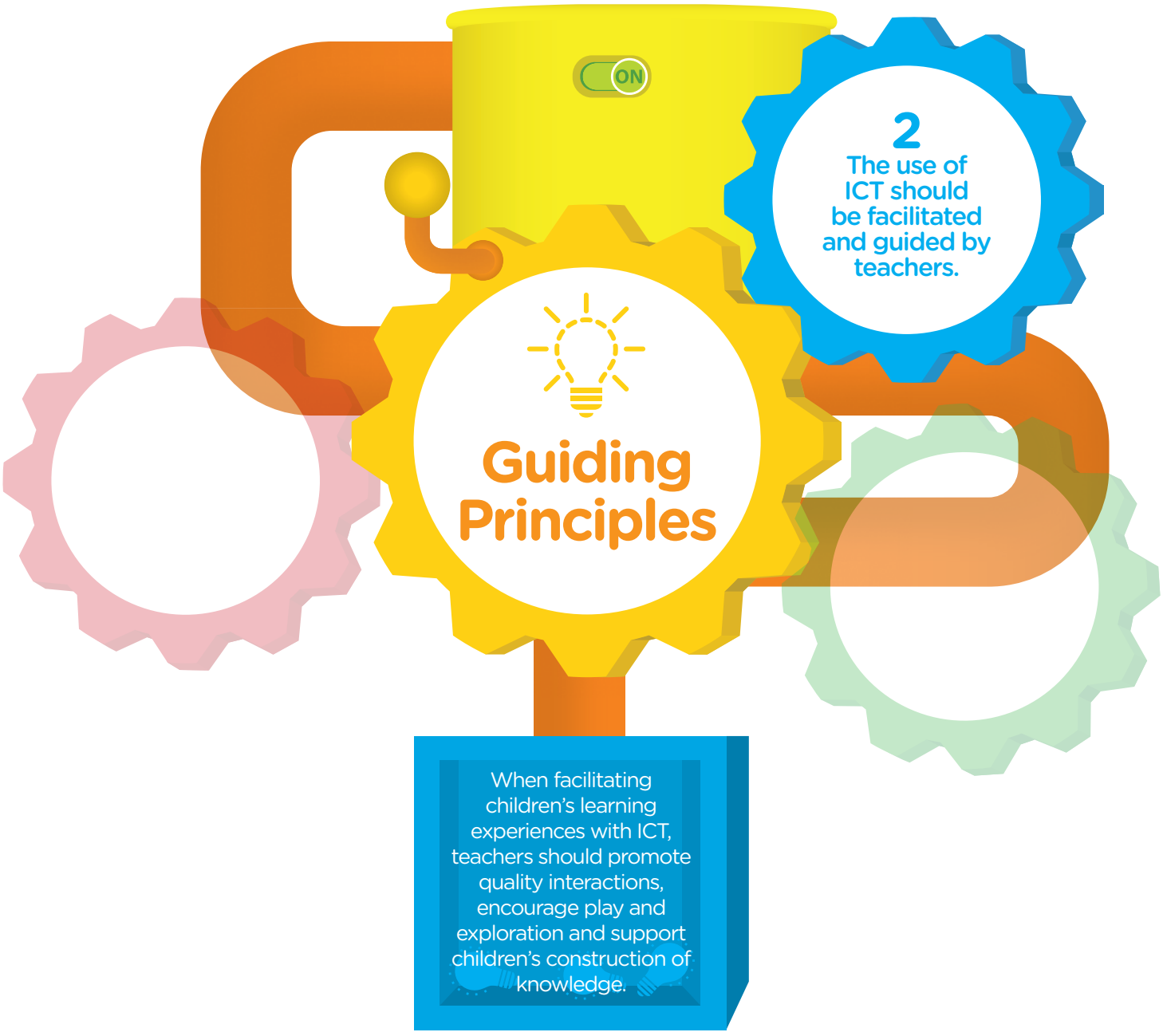
# GUIDING PRINCIPLE 2




At this young age, children are still learning and developing foundational knowledge and skills. **Children should not be expected to be independent users of ICT.** Rather, their use of ICT should be facilitated and guided by teachers.

# FACILITATING AND GUIDING CHILDREN'S EXPERIENCES WITH ICT

Facilitating and guiding children's exploration with tech toys

When teachers **facilitate** children's learning experiences, they **scaffold children's play and exploration** by "structuring interactions and developing instructions in small steps" based on children's existing abilities and prior knowledge (MOE, 2012, p.33).

When teachers **guide** children in their experiences with ICT, teachers give **clear instructions that set expectations and appropriate ways of using ICT for learning.** This is with the aim of ensuring children's safety and well-being. The amount of guidance that teachers provide depends on the functions of the ICT tool or resource, and whether these functions pose possible risks to children's safety and well-being.

**For teachers to effectively facilitate and guide the use of ICT, they will need to be knowledgeable of the functions and capabilities of the ICT tool or resource.** This will help them to use the appropriate ICT tool or resource to support children's learning and development in an intentional and meaningful way, and not merely using it to engage children.

This may be seen when children explore tech toys. The learning objectives could be for children to apply their knowledge of directions (e.g. forward, backward, left and right), as well as sequencing and ordering skills. As children explore the tech toy, teachers could facilitate their exploration and application of their prior knowledge and establish their understanding with open- and close-ended questions. Teachers should look out for potential risks which the resource may pose to the children and provide the necessary instructions, routines and expectations. For instance, they may show the children the correct way to charge the batteries of the tech toy. They should also set expectations that promote children's well-being, such as how children can take turns and assign roles to each other so that they can explore and play with the tech toy together.

**Example 2 below shows how teaching practice could take reference from guiding principle 2:**

# Children using video-recordings to reflect on their motor skills development

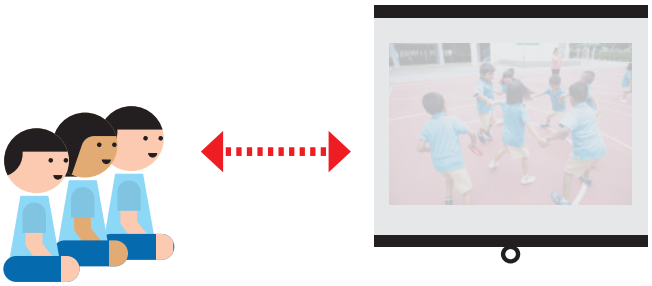
To develop children's gross motor skills, specifically the locomotor skill of sliding, the teacher first demonstrated to them how to slide. She then showed them picture cards which depicted the movement in a step-by-step manner. The children were then given the opportunity to practise sliding through a game and the teacher video-recorded their movements. After the game, the video-recording was shown on a large screen and the children watched their movements, reflecting on how they could improve on their sliding skills.


Learning the sliding movement

Video-recording children practising their sliding movement through a game

# How teachers facilitated and guided children's learning using video-recordings

The teacher **guided** children's viewing of the video by putting in place the following routines and expectations:



When children viewed the video clips as a class, the teacher set a minimum distance between the first row of children and the screen. She also ensured that the video clip was viewed under suitable lighting. This would ensure proper seating posture and protect children's eyesight.

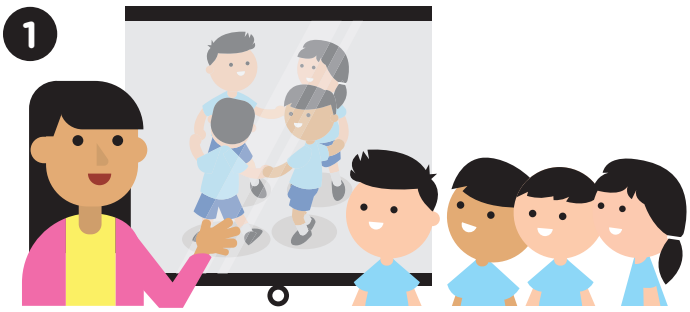
Children were reminded to give comments that would encourage their friends to do better.

**Reviewing their sliding movement**

While the children were watching the video-recording, the teacher asked questions to enable them determine if their sliding movements were properly executed and what they could do to improve their skills.

**For example, the teacher and children could be engaged in the following conversation:**

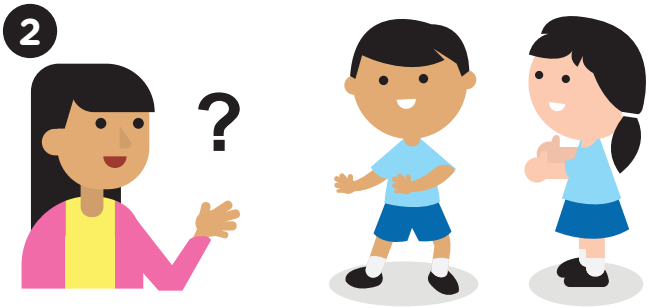
1



**Teacher:** Was the sliding movement done well?

**Children:** Yes!

2

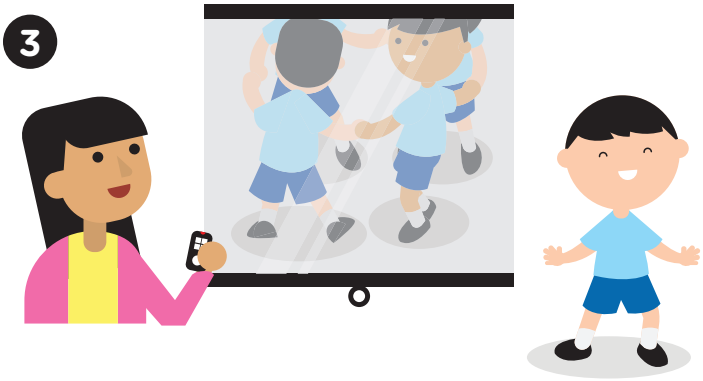


**Teacher:** Why do you think it's well done?

**Child A:** Because I saw Child D's legs go like this *[The child stands up to demonstrate].*

**Child B:** Yes! Step, and close.

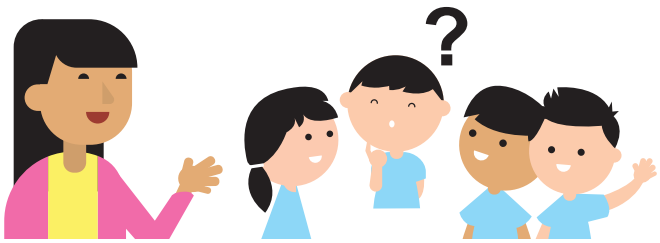
3



**Teacher:** That's right. Both Child A and Child D in the video are sliding well. Let's look at the video again. *[Replays that video segment]*. Child D takes a step and then he ...

**Child D:** Closes his legs! Step and close. *[saying the words as he watches the playback].*

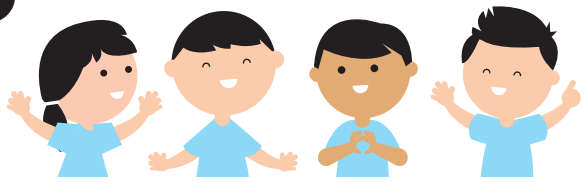
4



**Teacher:** Yes. That's how you should slide, Child D. I wonder how you can do it better. Do you have any ideas? *[Child D shrugs his shoulders]* It's ok. Let's ask our friends to help us. Children, if you were Child D, how would you do this better?

**Child C:** I will slide faster.

5



**Children:** *[Some children say this]* Faster, faster! *[Other children say this quickly]* Step, close; step, close; step, close!

6

**Teacher:** Those are good suggestions. We can slide faster and more smoothly – Step and close, step and close.

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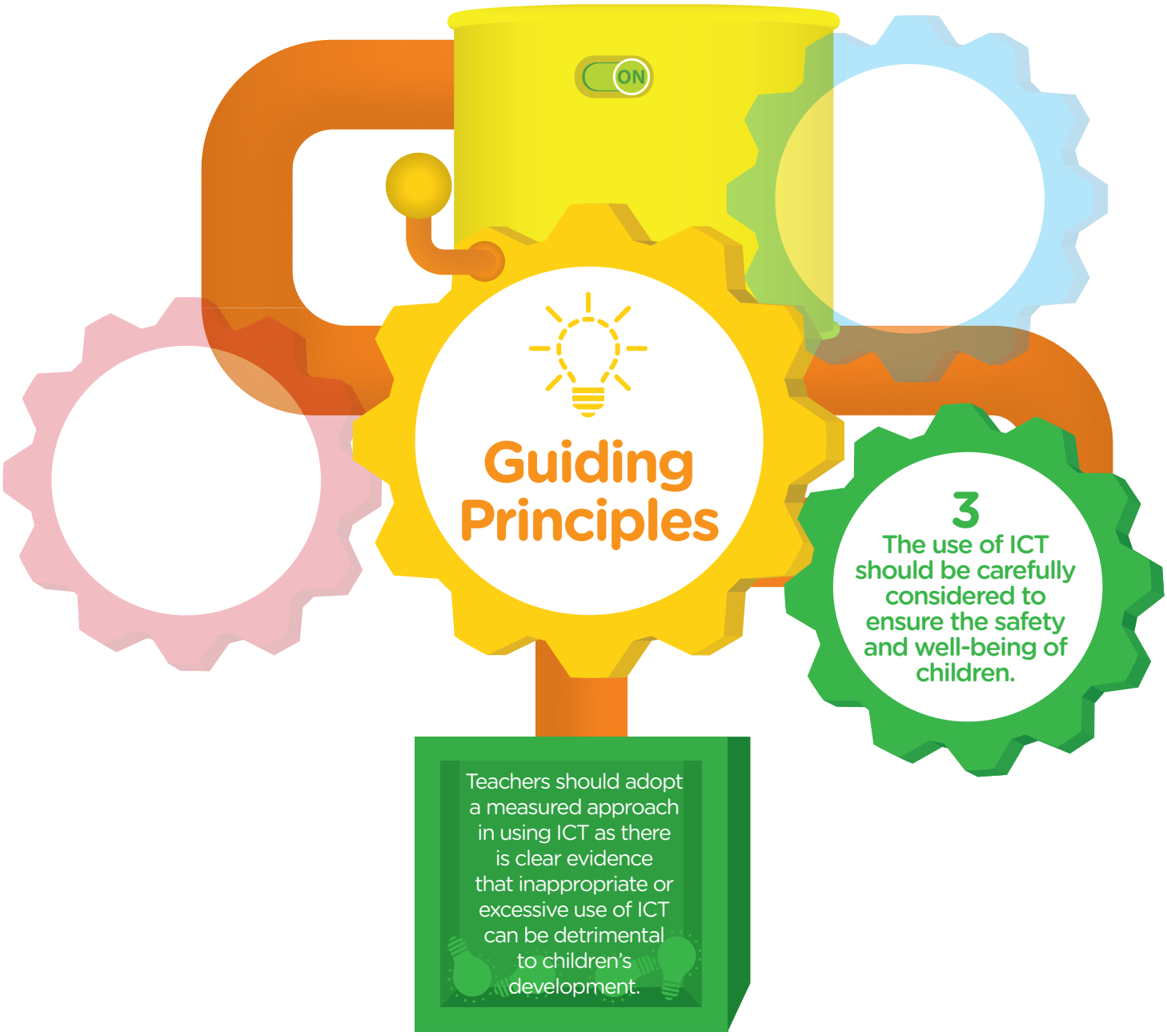
# GUIDING PRINCIPLE 3




There is research evidence of the negative effects of excessive use of ICT by children. In addition, the rapid advances of technology such as the emergence of social media platforms can pose a risk to children's safety and well-being. Hence, teachers must be cautious in their use of ICT for teaching and learning.

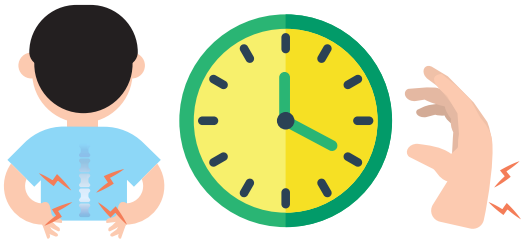
# ROLE OF TEACHERS IN ENSURING CHILDREN'S SAFETY AND WELL-BEING WHEN USING ICT

Teachers should not allow children to view television or online videos, play video games, or access applications with no facilitation or guidance. Research has shown that passive viewing[3] has little educational benefit. In addition, studies on older children found that passive viewing may affect their behaviour, attention, focus, academic performance, weight, social development, language development and psychological well-being (Page et al., 2010).

Teachers should ensure that children do not spend an excessive amount of time with ICT and that this does not replace core experiences of engaging with concrete materials and participating in hands-on activities. Teachers should be mindful of the negative impact of ICT on children's learning and development when this is not used with care.

Appropriate use of ICT complements children's engagement with concrete materials, participation in hands-on activities and social interaction with others; it is in line with the belief and principles of the NEL Framework.

**Inappropriate uses of ICT include but are not limited to the following:**



**Non-ergonomic use of ICT tools** (e.g. inappropriate angling of the wrist, poor seating posture and viewing of digital screen over a prolonged period)


**Loss of privacy and confidential information** (e.g. from sharing of home address and personal photographs)

**Exposure to inappropriate materials** (e.g. games or Internet-based resources) **that have violent or sexual content, undesirable gender or cultural stereotypes, and advertisements**

[3]Passive viewing is defined as the sedentary watching of, and interaction with any media form that does not have clear learning objectives or promote social interaction.

## The table below summarises the possible effects of ICT on children based on how ICT is used

| | Appropriate use | Overexposure and inappropriate use |
|---|---|---|
| **Cognitive Development** | • Higher psychomotor, cognitive and metacognitive abilities (Holloway et al., 2013)<br>• Emerging knowledge about print in digital contexts (Beschorner & Hutchison, 2013) | • Poor executive functioning skills and attention deficit (Rowan, 2013) |
| **Social and Emotional Development** | • Potential for increased motivation in learning (Westby & Atencio, 2002)<br>• Opportunities for play and social interaction, catalyst for social interaction (Tran & Subrahmanyam, 2013)<br>• Increased social engagement (Holloway et al., 2013) | • Possible problematic behaviours such as temper tantrums and being easily irritated (Mullan, 2014) |
| **Physical Development** | • Better psychomotor and gross motor assessments performance (Li & Atkins, 2004) | • Eyestrain and repetitive strain injury (Plowman & Stephen, 2003)<br>• Obesity (Rey-Lopez et al., 2008) |

The possible negative effects listed in the table can be minimised when teachers equip children with the knowledge and skills to use ICT which will safeguard their safety and well-being (Ey and Cupit, 2011).

It is also important for teachers to **be aware of the advances made in ICT.** This would help them seize opportunities to use ICT in a way that complements children's learning experiences, as well as to anticipate and address possible issues related to children's safety and well-being. For example, some programmes allow users to download pictures or videos without the live-streaming of advertisement content[4] and this function should be used by teachers as much as possible. Young children should always be supervised by adults when accessing content with ICT devices. Nevertheless, when children unknowingly access undesirable content, teachers should help children understand that they are to stop viewing and seek the help of their teachers or parents immediately.

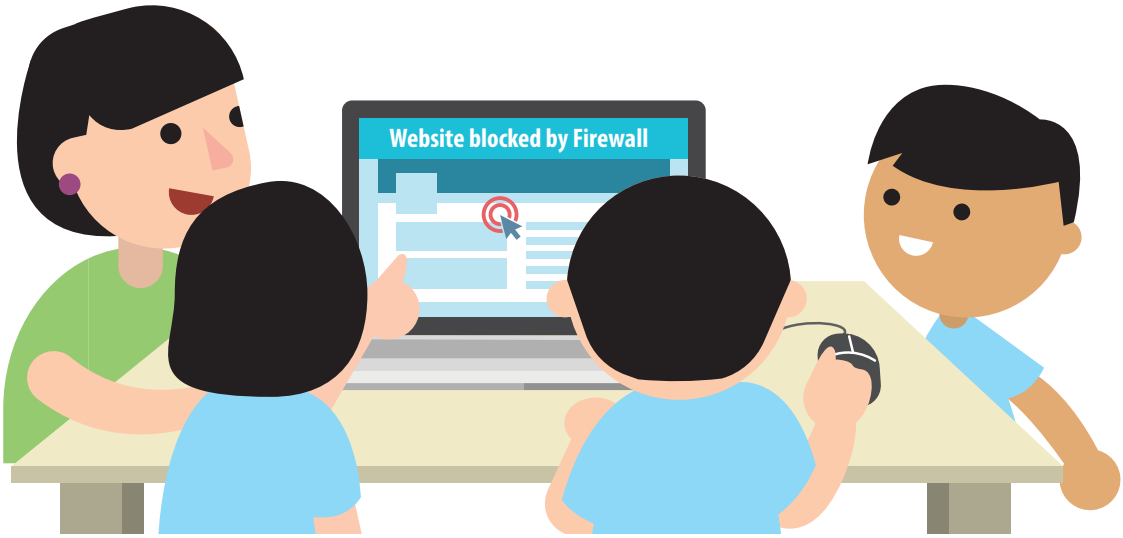
[4]Commercials have the potential to impact children's behaviour. With just one exposure to a commercial, research has shown that children are able to remember the content and develop a desire for the product. For example, a child who first views an advertisement for snacks may not be convinced to try healthy foods when he later views a child-directed commercial for healthy eating (American Psychological Association, 2004).

Teachers and parents can refer to the guidelines published by the Singapore Health Promotion Board (HPB) and the Media Literacy Council (MLC) on recommendations for the length of time that children should use ICT tools. Both agencies recommend that children's use of technology be limited to 1-2 hours daily. In addition, HPB also recommends increasing the number of outdoor activities for children, reducing the amount of time spent on near work, and limiting the amount of continuous near work.

Pre-school centres that incorporate the use of ICT tools in their programmes are strongly encouraged to **ensure that relevant safeguards are put in place.** Examples of such safeguards include filters, firewalls and monitoring software. These prevent unsolicited and inappropriate materials from being viewed by children and alert teachers to potential misuse of ICT tools by children. Nevertheless, teachers should not depend only on these tools to safeguard children's well-being. **Teachers' active supervision and facilitation when children use ICT remain crucial in ensuring children's safety.**

When children are creating digital content, teachers would need to be mindful of how they wish to share the digital content with others. They should consider whether there is a need to post such content on the Internet as this creates a digital footprint[5] of children which **may pose certain risks to children's privacy and safety** (Holloway et. al., 2013).

Pre-school centres would also need to comply with the requirements of the **Personal Data Protection Act (PDPA)** to safeguard personal data of families and children registered with their centre. Details of how centres can apply PDPA to their daily operations can be found online[6] in the "Advisory Guidelines for the Education Sector" (PDPC, 2014) developed by the Personal Data Protection Commission.



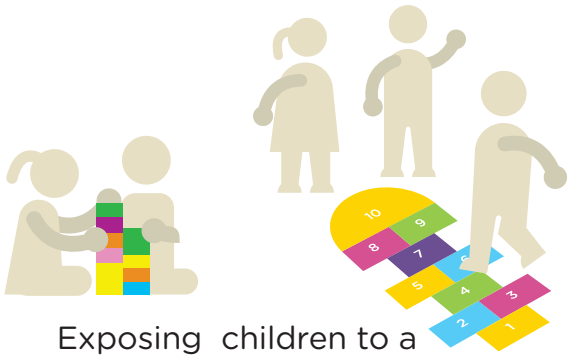

**Ensuring relevant safeguards are put in place**

[5]Digital footprint refers to the history of online activities that an individual participates in which others can access and track. Examples of online activities include photographs posted online, comments made on websites or social media platforms.

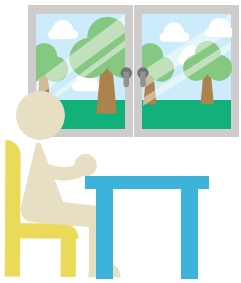
[6]http://www.pdpc.gov.sg/docs/default-source/public-consultation-4---education-healthcare-social-services-photography-submissions/advisory-guidelines-for-the-education-sector.pdf?sfvrsn=2

# WORKING TOGETHER AS A CENTRE AND WITH PARENTS TO ENSURE CHILDREN'S SAFETY AND WELL-BEING

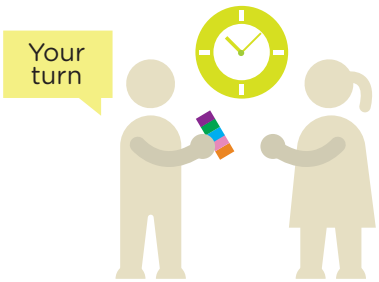
**Teachers and pre-school centres can build children's resilience towards the negative impact of excessive and inappropriate ICT use by doing the following:**



Exposing children to a **variety of activities** to nurture their diverse interests



Building **healthy habits**




Developing children's **self-management skills**

Sometimes, children may show signs of excessive ICT use (e.g. preoccupation with the use of ICT to the exclusion of other types of activities). Pre-school centres should provide timely intervention by drawing children away from ICT through building meaningful real-life experiences and relationships and seeking help from counsellors when there is a need.

The practice of healthy habits and safe practices in the pre-school centre should also be communicated to parents who can support these habits and practices at home where children have access to ICT tools. **Teachers should engage parents to help them understand both the benefits and risks of using ICT and how they can adopt safety rules and healthy habits that would ensure the well-being of their child.**

**Example 3 below shows how teaching practice could take reference from guiding principle 3:**

## Parent-child activity of creating an e-book

Children and parents were encouraged to create an e-book that captures what they love about Singapore, in line with the upcoming event of celebrating Singapore's National Day. The objectives of the activity were to promote bonding between children and their parents, and to nurture an appreciation for Singapore.

The e-books were created through a mobile application and contained short write-ups, photographs and videos of what children and their parents love about Singapore. Selected e-books were adapted and published in a coffee-table commemorative book to celebrate National Day and the Singaporean identity.


**Excerpts from the commemorative book showcasing selected e-books**

## How teachers partnered with parents to develop the e-book

Teachers reiterated to parents the centre's policy of seeking permission to feature photographs and videos shared in the e-book to a wider audience. Hence, parents' participation was voluntary as they needed to give permission to share their lives and identities portrayed in the e-book to a wider audience. Teachers also informed participating parents that as the family's e-book may be featured in a publication, the photography and video materials they used must be their own and not copyrighted. The use of copyrighted materials without permission would infringe intellectual property laws and would not set a good example for their children.

During the process of creating the e-book, teachers were in contact with participating parents, sharing with them tips on how they could involve their children in the e-book. Teachers encouraged parents to focus on the process and not the final product. This enabled children and their families to enjoy the process of learning more about each other, strengthening their relationships and enhancing children's social and emotional well-being. Teachers encouraged parents to go to the places of interests that their children had mentioned and to take pictures of these places to develop in their children a healthy interest to explore Singapore and nurture their curiosity.

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# USING THE GUIDING PRINCIPLES TO PLAN QUALITY LEARNING EXPERIENCES

**Example 4 shows how teachers used the three guiding principles as a whole to support them in planning quality learning experiences that make use of ICT.**

## Using stop-motion animation to develop children's language and literacy skills as well as teamwork

The teacher decided to explore with the K1 children the use of stop-motion animation[7] to dramatise a simple story that they had created as a class. The main objectives for using the tool were to enhance children's understanding of the story and develop their ability to work with one another in a group.

Children in each group moulded their own set of clay story characters and wrote the lines of the story using invented spelling. The teacher then worked with each group to animate the clay story characters according to the story.

For each line of the story, the children decided on the setting and the movements of the characters. For each movement, a snap shot was taken and saved to a software programme. Hence, each line in the story corresponded to a series of movements and captured images. The teacher and children reviewed each image or a video sequence of the images that they had taken and which the software programme had strung together to create a stop-motion animation.

**Writing the storyline with invented spelling**

The final product of each group's stop-motion animation was then played to the class for children to enhance their understanding of the story as well as to reflect on how they had worked as a team to develop the stop-motion animation.

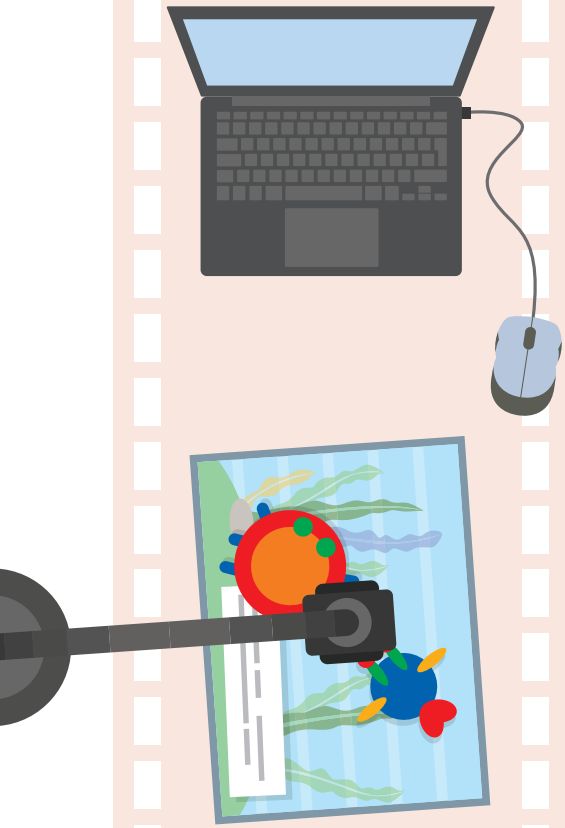
[7]Stop-motion animation is about making stationary objects appear as if they are moving. In this example, the stop-motion animation is made using a digital camera that is held up by an apparatus. The digital camera is connected to the laptop that has a software which takes pictures of each object's movement and puts these pictures together to form an animated sequence. The centre is in the midst of exploring using touch tablets instead of laptops for ease of use by children.

Moulding the characters of the story

## How teachers considered guiding principle 1 in the design of the activity

| Aspect of guiding principle 1 | Planning the creation of stop-motion animation |
|---|---|
| How the creation of stop-motion animation is **developmentally appropriate** | Before the teacher introduced the ICT resource to the children, she explored it with her fellow teachers to evaluate whether the use of the tool would be developmentally appropriate for their K1 classes. In the teachers' exploration, they discovered that the digital camera could be fixed in a stationary position so that children could explore the movements of their characters and changes in setting without worrying about the positioning of the digital camera. The commands of the software programme seemed simple enough for children to follow but would require a teacher to scaffold and guide children's use from time to time, in particular when reviewing the snapshots. **With the appropriate support, children could be competent learners in this activity.** |

## How the creation of stop-motion animation **complements children's learning experiences**



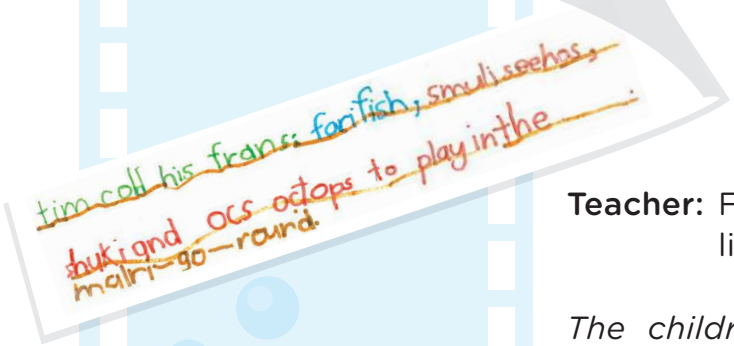
The teachers also evaluated how stop-motion animation complemented children's learning experiences. **They looked at how their planned learning objectives such as children being able to work and play cooperatively in a group could be achieved through children's creation of stop-motion animation.** In their discussion, they compared the creation of stop-motion animation with conventional forms of story retelling such as a video-recorded dramatisation which they had already done with their classes. They agreed that one of the main advantages of creating stop-motion animation was that it required greater coordination and team work from the children. In dramatisation, children would discuss and agree on their character's actions and what they say. When dramatising the story, all children had a role but the main characters usually had more lines and actions compared to the other characters. However, when children created a stop-motion animation, the movements of all characters contributed towards making a good animation. **The additional rules in creating stop-motion animation, such as making small movements and keeping one's hands away when the digital camera is taking a picture required children to exhibit greater teamwork** as compared to the video-recorded dramatisation which children were familiar with.

To enhance children's understanding of the story, children were given the opportunity to create and move their own characters and change the story's setting. With dramatisation, one or two children in each group would take the lead to decide how the story would be acted out. With the creation of stop-motion animation, the teacher observed that there were more opportunities for each child to play a crucial role in determining each snapshot. Children were engaged in discussion on how to move their characters to illustrate the line in the story. Facilitated by the teacher, they coordinated the movements of characters so that they could take different snapshots which they reviewed immediately and decided whether it portrayed the line in the story. **There was greater involvement from every child in the group to animate the story, enhancing their understanding of the story.**

Moving the characters according to the scene

## How teachers considered guiding principle 2 in carrying out the activity

| Aspect of guiding principle 2 | Creating stop-motion animation in the activity |
|---|---|
| **Facilitating and Guiding** children's creation of stop-motion animation to support children's efforts in working together as a group | As the children got their characters into position for the next scene, the teacher facilitated their discussion of how they wished to portray the lines, "They played for a long time. They were happy.". The dialogue on the next page shows how the teacher facilitated the children's discussions to enhance their understanding of the story, in particular the line, "They played for a long time": |




**Teacher:** For these lines in the story, how would you like to move your sea creature?

*The children moved their sea creatures. Child A hesitated and then said the following:*

**Child A:** I want to move Okti like this. Over there.

*The child started moving Okti the Octopus across the merry-go-round.*

**Child B:** No you... you're not supposed to move like that.
**Teacher:** Why not?
**Child B:** It's too big. We must move with small steps.

*Other children in the group nodded their head in agreement or echoed the same statement made by Child B.*

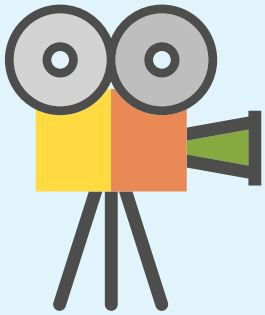
**Teacher:** Yes, we need to make small movements. But can Child A move Okti the Octopus across with small steps?

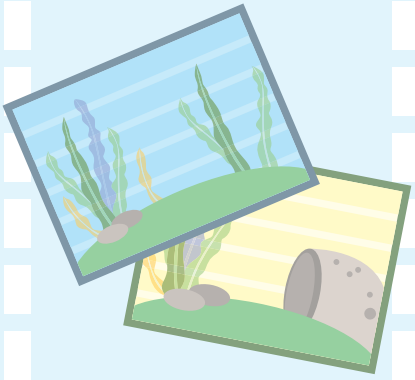
*A slight pause. Some children still said "no".*

**Teacher:** Child A, why do you want to move it over there?
**Child A:** Okti wants to go to a new place. It's fun.
**Teacher:** I see. Children, what do the lines in the story say?
**Children:** *[Reading the lines]* "They played for a long time. They were happy."
**Teacher:** Yes, it says, "They played for a long time". The sea creatures have played a long time on the merry-go-round. Maybe they're feeling bored and want to change positions with their friends. Can they do that?

*Some children were agreeable but one child was not.*

**Child C:** If Okti moves here, Sharky will have no space.
**Child A:** Sharky can move here *[pointing to Okti's original position]*. And Okti moves there. Both will be happy.
**Child C:** Hmm... Ok.

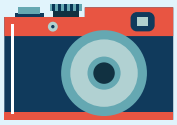
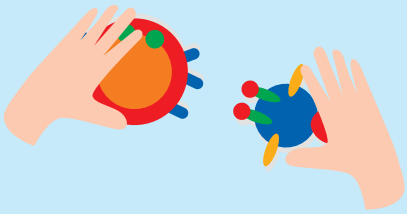
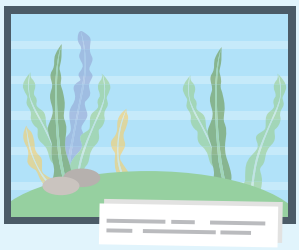




**As the teacher and the children explored creating stop-motion animation, they decided on some points to remind and guide each other on what they needed to do.** The following points were made into a simple checklist which was displayed in class:

- Decide on the group member's role
- Make small movements
- Take a picture of our work, not our hands
- Look back at the picture – Is it ok?

**The teacher also listed the different roles that were needed in creating the stop-motion animation** so that children could decide amongst themselves which roles they would like to take on. The roles were:

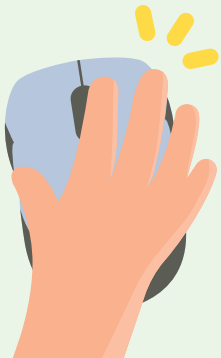
| | |
|---|---|
| **Camera man**<br>  <br>Clicking the button and taking the picture | **Animation Director**<br>  <br>Giving instructions when to take the picture and ensuring no hands shown in the camera frame |
| **Actors**<br>  <br>Moving the characters | **Props Director**<br>  <br>Changing the setting |

**The teacher guided children whenever they had technical difficulties in operating the software.** The teacher also monitored the time each group spent with the equipment and **ensured that the different groups experienced a range of activities related to the story and not just the creating of stop-motion animation.**

Children comfortably seated or standing and using the ICT tools with ease

## How teachers considered guiding principle 3 to ensure children's safety and well-being

| Aspect of guiding principle 3 | Reflecting on the process of creating stop-motion animation |
|---|---|
| **Carefully thinking through** the process of creating stop-motion animation | As the children explored with creating stop-motion animation, the teacher noticed their struggles in manipulating the mouse. She realised that children would need a suitable computer mouse that had a better fit with their hands and allow them to click the buttons with ease. This would prevent children from straining their hands and wrists, and give them better control of the computer mouse. |



The teachers also observed that some of the children sitting across the table had an upside-down view of the setting and characters. They noticed that these children had difficulty adjusting their character's movements and after a while, these children seemed less engaged in the activity as they had difficulty viewing the setting and moving their characters. Although there was insufficient space for all children to be facing the setting and characters the right way, the teachers gave opportunities for children to change seating positions from time to time so that all would have the opportunity to view the setting and characters the right way. Upon reviewing the activities, the teachers agreed that the size of the group would need to be reduced so that all children would be able to view the characters and setting easily and be more engaged. If the group size could not be reduced, teachers agreed that they could help the children understand the need to change positions from time to time.

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# CONCLUSION

Learning through play and quality interactions remain the key learning experiences of children. The use of ICT in teaching and learning should complement these experiences through teacher's facilitation and guidance, ensuring children's safety and well-being. If teachers wish to use ICT in their teaching practice, it is important to consider the three guiding principles as a whole so that children's learning experiences remain meaningful and appropriate.

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NURTURING
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