

CHILD

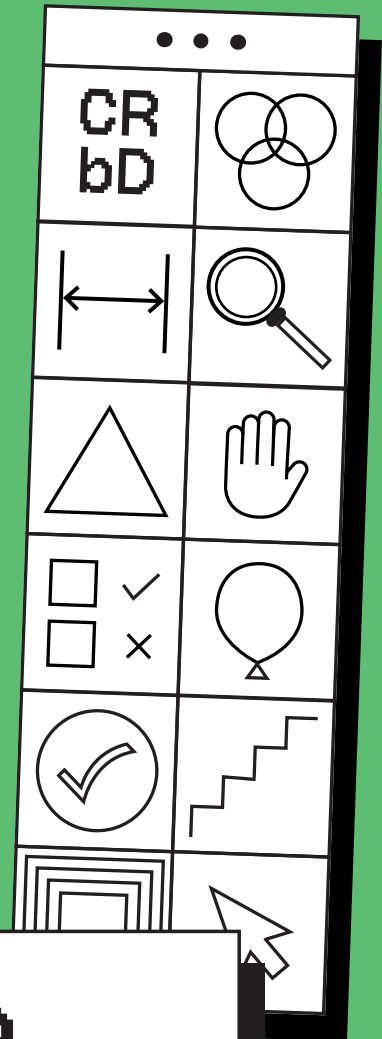
RIGHTS

by

DESIGN

March 2023

GUIDANCE FOR
INNOVATORS OF
DIGITAL PRODUCTS
AND SERVICES USED
BY CHILDREN



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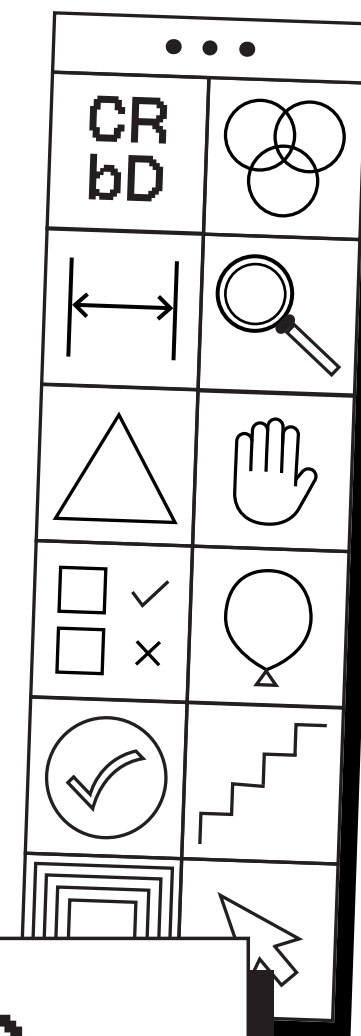
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THE DIGITAL FUTURES COMMISSION

The Digital Futures Commission (DFC) is an exciting research collaboration of unique organisations that invites innovators, policymakers, regulators, academics and civil society to unlock digital innovation in the interests of children and young people. It seeks to put the needs of children and young people into the minds and work plans of digital innovators, businesses, regulators and governments. It calls for a critical examination of how innovation is reconfiguring children's lives to reimagine the digital world in value-sensitive ways that uphold their rights and take practical steps to meet their needs.

The DFC research team, led by Professor Sonia Livingstone OBE, has three workstreams: play in a digital world, beneficial uses of education data, and guidance for innovators. Each is informed by children's voices and underpinned by research and outputs geared toward real-world change for children.

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Biographies for the Commissioners are [here](#).

Biographies for the researchers are [here](#).

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FOREWORD

This report puts a spotlight on children. It responds to their views and puts forward strategies for designing with them in mind. Recognising that the digital world is increasingly the environment for news, information, entertainment, play, learning and social communication, it must follow that designers should be conscious of children as they conceive, build and roll out digital products.

The value of designing with the customer in mind is considered standard across most consumer-facing products and services. And yet, I am stunned how often, in the digital world, the presence of children is forgotten - or maybe, more accurately, how often companies choose to adopt a policy of 'don't look, don't see'. Those designers that we have spoken to across the lifespan of the DFC have been very clear about their excitement and ability to design with children in mind. The barriers, most often, lie in the priorities of the businesses for whom they work.

This report calls on CEOs and investors to recognise that forgetting children in the design of products is both a reputational risk and a societal harm. And that it is vital to create pathways that acknowledge children's right to participate in a digital world in ways that are mindful of their privacy, safety and development needs. This short report will set designers confidently on that path, and I urge all those who are empowered to do so to put the needs of children at the top of your corporate concerns.

This report comes at a key moment. There is a growing consensus, internationally, that it is necessary to design for children online – consider the building blocks of data protection and privacy set out in the UK, Irish and Californian Age Appropriate Design Code; children's participation freedoms articulated by the UN Convention on the Rights of the Child and its companion document General Comment No 25, setting out the relevance of children's rights to the digital environment; the formative principles of the DFC's own Playful by Design tool – and the carefully considered work of the IEEE in setting out a comprehensive risk assessment process in the IEEE2089 standard, Age Appropriate Design for Children's Digital Services. These, along with other academic and policy advances, offer a digital future in which the needs, voices and rights of

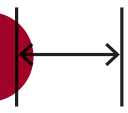

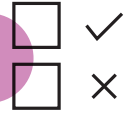








children are at the forefront of designers' minds, and an unavoidable concern of business.

As ever there are many to thank, particularly the designers, developers and DFC commissioners who engaged with the Digital Futures Commission to explain their working processes and practices – notably from the LEGO Group, BBC R&D and Erase All Kittens. Thanks too to the report's authors Professor Sonia Livingstone and Dr Kruakae Pothong for whom this was a labour of love as well as a piece of academic work.

All the work of the DFC is done for and with children and young people. We thank them for their contributions to this Child Rights by Design report. We are endlessly impressed by your creativity, wisdom and words, and we work alongside you to build the digital world young people deserve.



– **Baroness Beeban Kidron OBE**

CHILD RIGHTS by DESIGN PRINCIPLES	
	1. EQUITY & DIVERSITY Do you treat all children equally, fairly and support vulnerable children?
	2. BEST INTERESTS Are children's best interests a primary consideration in product design?
	3. CONSULTATION Are children meaningfully consulted in developing your product?
	4. AGE APPROPRIATE Is your product appropriate for child users or adaptable for different ages?
	5. RESPONSIBLE Do you review and comply with laws and policies relevant to child rights?
	6. PARTICIPATION Does your product enable children to participate in digital publics?
	7. PRIVACY Have you adopted privacy-by-design in product development and use?
	8. SAFETY Have you adopted safety-by-design in product development and use?
	9. WELLBEING Does your product enhance not harm children's physical & mental health?
	10. DEVELOPMENT Does your product enable children's learning, imagination, play and belonging?
	11. AGENCY Have you taken steps to reduce compulsive and exploitative product features?

WHAT IS 'CHILD RIGHTS BY DESIGN'?

Digital technologies have become part of the infrastructure of children's daily lives. During the COVID-19 pandemic they provided a lifeline for social interaction, education, play and participation. Not only is digital engagement no longer optional for children; it's also now crucial to their development and prospects, and realisation of their human rights. So, it is timely for innovators to reflect on the possible impacts of their digital products and services on children and child rights; they must also find ways to design differently and better.

Child Rights by Design is a principled vision to inspire innovators to help realise children's rights when designing digital products and services. It is grounded in the United Nations Convention on the Rights of the Child (UNCRC), the most widely ratified international human rights treaty ever, applicable to all children from birth to 18 years old. It builds specifically on the UN Committee on the Rights of the Child's authoritative statement of how to implement the UNCRC in relation to the digital environment: General Comment No 25.¹

In this guidance, we explain the 11 Child Rights by Design principles and match them with practical advice. Please put the principles on your office wall, bookmark it in your tabs, or pin it to your design boards!

WHO IS THIS GUIDANCE FOR?

Child Rights by Design is for innovators of digital products and services likely to be used by or impact on children. So, what does 'good' look like for children in a digital world? Informed by the insights and authority of the UNCRC, we offer guidance for anyone deciding on priorities, policies, values and standards, and those building the systems, artefacts, processes and products.

- By innovators, we include designers, developers, product managers, executives, marketers, UX (user experience) researchers and professionals in the legal, policy or planning departments of start-ups, mid-sized companies and major corporates, as well as those working on standards, compliance and procurement in the public, private or third sector. A 'by design' approach must engage the whole organisation, from the CEO onwards, although we especially have designers in mind.
- We include digital products and services intended for children and the many products and services that children

¹ The UNCRC and General Comment No 25 (UN Committee on the Rights of the Child, 1989, 2021) are primarily addressed to states, but also address business responsibilities (in accordance with UN, 2011; UNICEF, 2012). Both the UNCRC and General Comment No 25 are referred to throughout this guide.

use – perhaps unnoticed – as part of a broader market. We also include products and services that children don't use directly but that impact them (cameras in public places, school information management systems, health databases or parental control tools). This includes a host of products and services across the value chain.

To make this guidance clear and practical, we consulted innovators, practitioners, experts and children. Designers in particular asked us: how can they meet the needs of children of different ages; balance protection and participation; involve children in design; and know whether they have got it right? We answer many such questions here.

“When we design for preschool toys, we’ve got a lot of guidance... I’ve been designing all my life, but when it comes to the digital, I would say I would not know where to look... I would not know the limits of designing for a kid.”

(Independent digital designer)

To be relevant to the vast diversity of digital products and services that impact on children, we focus on high-level principles that embed child rights, married to provocative questions that can shape design thinking. To create a single resource in a crowded field, we learned from related initiatives, providing pointers to the many valuable resources we have come across. To ensure the guidance meets innovators' needs, we consider each of the 11 Child Rights by Design principles in turn. Finally, to ensure that digital innovations benefit children, now and in the future, we call on designers to engage with our recommendations.

A note on context. The Digital Futures Commission has conducted this research mainly in the UK, where we consulted children, interviewed innovators and mapped relevant legislation. However, while context matters, our guidance is not restricted to the UK. The challenge we address is global, as is the UNCRC and the scope of many companies that impact children's digital lives. Our work has benefited from good practice emerging internationally, and we hope it will inspire others.

WHY IS THIS GUIDANCE NEEDED?

The idea of ‘by design’ harnesses the generative power of providers, designers and policymakers to shape technological innovation in ways that prioritise values that promote human wellbeing – privacy, safety, security, ethics, equality, inclusion and, encompassing all these, human rights including children's rights.²

The digital environment has not been designed with children in mind. Nor does it always respect and support their needs. This results in multiple problems, often unanticipated and unintended. While media headlines call out the most egregious risks of harm to children's safety, privacy, agency and wellbeing, less attention is paid to the missed opportunities to benefit children when digital providers neglect their child users. Research reveals how digital technologies pose risks and opportunities for children. Still, its insights may fail to reach those who can build on them in practice.

Encouragingly, there is growing attention to children's rights within policy, business and design communities, and a diversity of initiatives nationally and internationally seeking to embed human rights, ethics and design justice in technology policy and practice. These changes are spurred on by new regulations, civil society demands and public concerns, including from children, about children's digital lives. Change also comes from innovators who want to ‘do the right thing’, and good practice examples are accumulating. Policymakers can support businesses by facilitating and incentivising child rights-respecting innovation.

Although many promising steps are being taken by those developing digital products intended for children, there is less attention from those who develop the many other products children use or are impacted by. And for the most part, the focus is on the ‘hygiene’ factors of safety and security, sometimes privacy, neglecting children's positive rights or the crucial balance needed between different risks, opportunities and rights.

Our #DigitalFutures research surfaced some confusion about which regulations apply to which products, how to embed abstract human rights in concrete development processes, and how to manage competing priorities – especially when commercial drivers threaten to overrule children's best interests.

“We know that, as much as we are intending to do good, there are always unintended consequences... In terms of bias within the [machine learning] systems, we did workshops around trying to apply that ... [and] we found that we did have some bias... So we went back and built an anti-bias system that was bespoke.”

(Large media organisation)

We acknowledge that designing for child rights isn't easy. But retrofitting design to respect rights after a product is developed can be difficult, and expensive. And there are growing calls from within and outside business to rethink decisions that shape user outcomes in ways that embed values and may positively impact their rights. These suggest that a wholesale shift in culture across the supply chain (investors, advertisers, boards, etc.) is underway, as it should be.

Bridging high-level principles and practical challenges, we set out what innovators need to know for their digital products or services to realise Child Rights by Design. By implementing this guidance, children's engagement with the digital world will be immeasurably improved.

“I'm trying to think of ways where we can bring in this Privacy by Design to really make people feel secure... I see everything that you've mentioned as far as different product features, safety features, as something that would be very crucial and core to my product market development, that would have to happen before we monetise.” (Social media start-up)

³ General Comment No 25, para 39.

WHAT THE GUIDANCE OFFERS

All businesses that affect children's rights in relation to the digital environment [should] implement regulatory frameworks, industry codes and terms of services that adhere to the highest standards of ethics, privacy and safety in relation to the design, engineering, development, operation, distribution and marketing of their products and services ... and take measures to innovate in the best interests of the child.³

How can innovators put this into practice? The 11 Child Rights by Design principles were derived from the UNCRC, elaborated with insights from General Comment No 25 on children's rights in relation to the digital environment, and explored with children, innovators – especially designers – and child rights experts.

The guidance is grounded in the everyday realities of designers and developers, whether or not their digital products are intended for children, as well as the lived experiences of children and families.

For each principle, we provide:

- An account of how specific child rights apply to digital products and services
- Distilled insights from expert sources and links to relevant legislation
- Reflections on the principle from children and young people
- ‘Stop and think’ questions to ask yourself throughout your design process
- Suggested sources of design inspiration and tools.

How might this help? Suppose you are developing a game to teach children STEM topics that operates on tablets for children aged 10 or older. You offer five games with the initial purchase and options to expand at extra cost. Making your product age appropriate might be a priority to appeal to your intended users. You may expect the product to support children's development. But the game mechanics and data collected during the game may raise issues of equity and diversity, even safety and agency. Neglecting these principles could result in legal, commercial and ethical problems.

So, read the relevant sections of this guidance. Then, review the checklist at the end to determine your next steps. Instead of a tick-box exercise, think of this as an exciting road map. We don't promise all the answers, but we are confident of the direction of travel.

HOW TO USE THE GUIDANCE

Organisations vary in how agile, flexible or structured their innovation processes are. They also vary in the resources they can call on – research, expertise, consultation, user testing and more. In the classic Double Diamond model of the innovation process by the UK Design Council⁴, there are four crucial phases – discover, define, develop and delivery. Discover and develop are expansive, opening multiple possibilities. Define and deliver are intensive, focusing these multiple possibilities first on a clear problem definition and design brief and then on a workable solution.

The 11 Child Rights by Design principles have a role to play in each of the four phases.⁵ In what follows, we organise our guidance according to these phases. However, we fully recognise that these phases can be differently labelled in different organisations, and that crucially, the overall process is more complex, messy and iterative in practice than the diagram shows, as innovators often told us. Therefore, we invite product teams in different kinds of organisations to adapt the guidance to suit their ways of working.

“There’s a very centralised route for product development, whereas with digital development it’s much more fragmented... With a physical product, once it’s done, it’s out there ... you can’t iterate it. But with the digital experience, you can, and so that has a positive in that you can pull back certain aspects of it and change certain aspects of it after launch.”

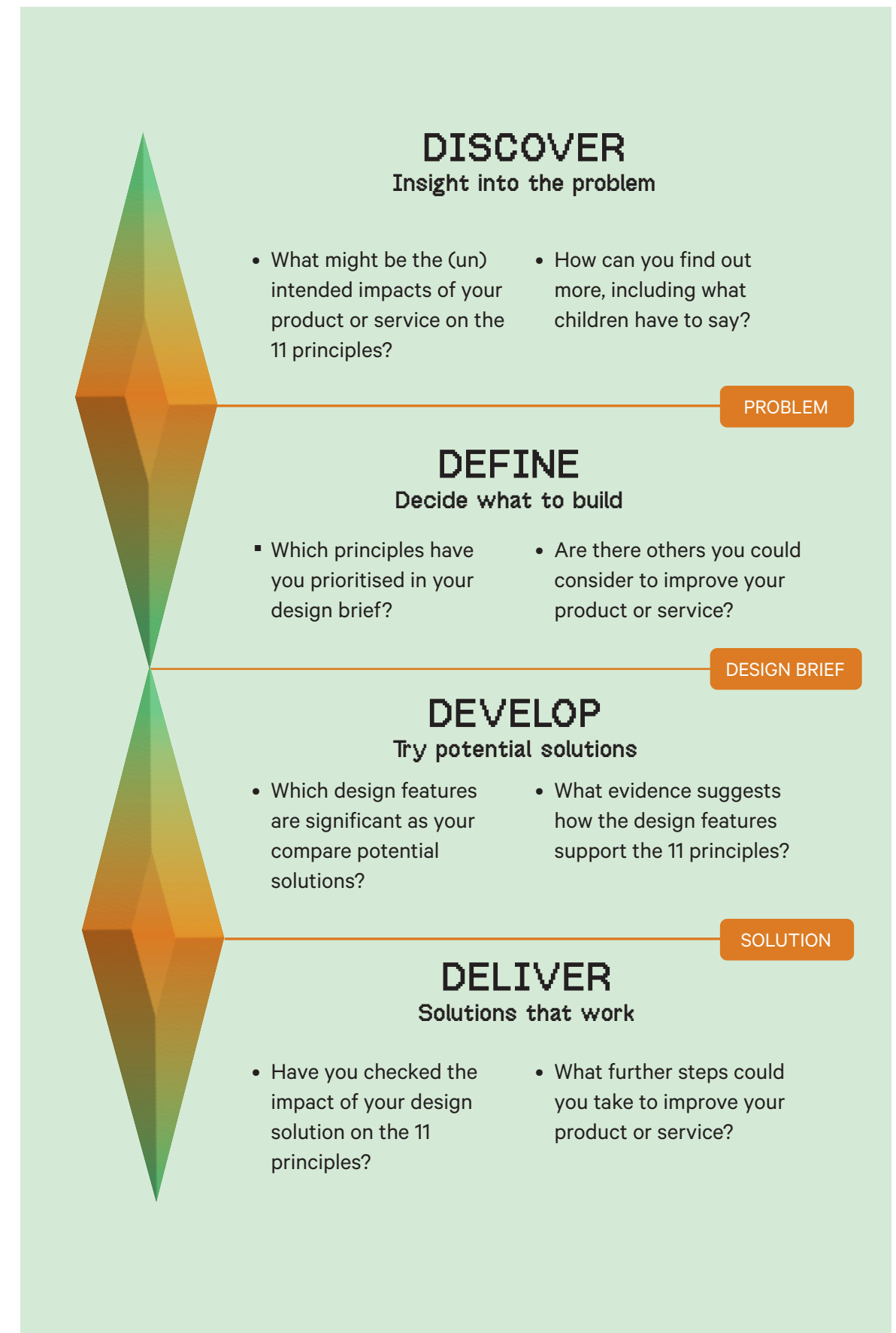
(Large toy company)

“This [diagram] is really good. It’s super clear and so important for products to be able to consider all of these points.”

(Education game start-up)

⁴ Ball (2019); Design Council (2019a, b).

⁵ Also relevant are the eight steps of a Child Rights Impact Assessment (CRIA); see ENOC (2020); Mukherjee et al (2021).



THE CHILD RIGHTS BY DESIGN PRINCIPLES

'What I want to change about the internet'

(13- to 14-year-olds, Yorkshire)

IT'D BE BETTER FOR MY PRIVACY IF APPS DON'T USE OR KEEP MY NUMBER/PERSONAL INFORMATION

ONE THING IS THEN THEY NEED TO MAKE AN EASIER WAY TO FIND YOUR FRIENDS ONLINE.

SNAPCHAT COULD MAKE IT MORE CHILD FRIENDLY LIKE SO RANDOM PEOPLE CAN'T JUST ADD YOU AND CAN'T SAY MEAN THINGS.

TIKTOK TO HELP PEOPLE INSTEAD OF SHOWING STUFF YOU DON'T LIKE AND HELP PEOPLE FOR WHAT THEY WANT.

TO INSTANTLY DELETE SOMETHING BAD ON COMMENTS TO MAKE IT BETTER.

I WISH THEY WOULD BLOCKS OUT CERTAIN WORDS SO IT WON'T UPSET PEOPLE.

LOTS OF PEOPLE THAT HAVE DIFFERENT [OPINIONS] ON TWITTER.

IT WOULD BE BETTER IF PEOPLE COULDN'T JUST MESSAGE YOU.

TIKTOK - TOO MANY PEOPLE WHO JUDGE EVERYONE ELSE. BAD.

IT WILL BE BETTER FOR MY PRIVACY IF PEOPLE CAN'T TEXT YOU ON INSTAGRAM IF YOU DON'T ALLOW THEM TO.

SNAPCHAT - THEIR FILTERS CAN BE CONTROVERSIAL E.G.; THEY CHANGE FEATURES TO MAKE YOU MORE "ATTRACTIVE".

BAD TIKTOK - RANDOM/GETS BORING

INSTAGRAM MAKE IT SAFER SO THAT PEOPLE CAN'T RANDOMLY MESSAGE YOU.

I WILL MAKE [SURE] THEY ARE NOT MEAN BY DOING SOMETHING BEFORE AND IF THEY BE MEAN, YOU CAN BAN THEM.

TIKTOK SHOWED POST MORE STUFF THAT YOU LIKE INSTEAD OF POSTING RANDOM VIDEOS.

SNAPCHAT CAN BE BAD SO I COULD TELL THEM TO BAN THE PEOPLE WHO CYBER BULLY.

TIKTOK - TO MANY PEOPLE HATING ON PEOPLE.

ONE BAD THING IS THAT YOU WILL END UP GOING ON IT EVERY DAY [AND] YOU WON'T GO OUT, YOU WOULD STAY AT HOME.

IT WOULD BE BETTER FOR MY PRIVACY IF ON INSTAGRAM RANDOM PEOPLE COULDN'T MESSAGE ME.

I HOPE THEY BAN MOST PEOPLE THAT HATE ON OTHERS.

ONE BAD THING IS THAT THERE CAN BE BAD STUFF ON IT WHICH CAN BE [DISTURBING] FOR OTHER PEOPLE.

TWITTER CAN GET TOXIC VERY EASILY WITH [DOXING] ISSUES ETC.

MY ONE WISH IS FOR TIKTOK TO NOT BE AS MEAN OR TO MAKE PEOPLE FEEL A SAFER WAY.

IT WOULD BE BETTER FOR MY PRIVACY IF DATA IS ENCODED IN A HARD TO UNDERSTAND FORMAT, SO IF A SYSTEM GOT HACKED THE DATA IS HARD TO READ.

TIKTOK - FOR IT TO STOP MAKING LIKES ♥ - SO IMPORTANT.

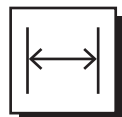
INSTAGRAM TO BE SAFER [BECAUSE] RANDOM PEOPLE CAN TEXT YOU.

BAN TOXIC PEOPLE. DON'T LET PEOPLE BULLY OTHERS AND MAKE SURE [IT IS] STOPPED.

DISCORD GROUP CHATS COULD HAVE A HIGHER LIMIT THAN 10, SO MORE PEOPLE COULD TALK BUT NOT AN ENTIRE SERVER.

MAKE THE APP MORE SAFE AND BAN PEOPLE [HATING] PEOPLE TO STOP BULLYING.

PRINCIPLE 1: EQUITY AND DIVERSITY



Be inclusive, treat everyone fairly and provide for diverse needs and circumstances.

Equity and diversity in digital design means that all children, regardless of their characteristics and circumstances, are treated fairly and have equal access to digital products and services, and the opportunity to use them in ways they find meaningful. It also means that children should not be treated unfairly or discriminated against through the design, operation or marketing of digital products that may impact on their lives.

The principle of equity and diversity draws together three sets of children's rights⁶:

- Non-discrimination: the right to be treated fairly and not discriminated against.
- Family provision and alternative care: to ensure that parents and caregivers are supported, and that children living in alternative care do not miss out.
- Special protective measures: to make explicit provisions for children with disabilities or those living in disadvantaged, marginalised or vulnerable situations, and empower parents and caregivers to support their children.
- Equity and diversity does not mean that all children should be treated just the same, or that innovators cannot tailor their products to particular user groups. But innovators should prioritise fairness by addressing the diverse needs and expectations of the children likely to use or be impacted by their product or service and taking active steps to avoid or overcome potential forms of exclusion or discrimination.⁷

"I would like to please not make apps so expensive because people can't all buy the apps they want."

(Child aged 7–8, Greater London)

Relevant legal frameworks and guidance

Designing equity and diversity in products and services is mandated in specific ways by the UK Equality Act 2010,⁸ among

⁶ UNCRC Articles 2, 9–11, 18, 20–3, 25, 27, 30, 35, 37–8, 40; General Comment No 25, paras 9–11, 87, 114–22.

⁷ General Comment No 25 recognises discrimination in the digital environment based on familial and personal circumstances that disadvantage or exclude children or exacerbate their vulnerabilities. It calls on states and businesses for preventive and corrective measures, including redress. See also Atabey (2022a, b).

⁸ The UK Equality Act 2010 provides legal protection in various areas of life against discrimination, harassment or victimisation based on protected characteristics; see UK Government (2015).

other laws, policies and standards. The Equality and Human Rights Commission's Equality Act 2010 Code of Practice gives practical guidance on how legal concepts in the Act apply.⁹ Inclusive design offers a good starting point to help digital designers provide for user diversity, disabilities or special needs.¹⁰ This is not always on the radar of digital designers.¹¹ The UK Government offers an introductory guide to making a service accessible and guidance and tools for digital accessibility.¹²

Design cases

Discrimination may be direct or indirect. An example of direct discrimination is content reinforcing prejudices about a particular group of children. By contrast, indirect discrimination occurs when artificial intelligence (AI) defaults to assumptions about a group of children, which results in their exclusion.

Discrimination can apply both to accessing a product and the experience of using it. If children are targeted with hate or girls' safety put at risk when they participate in digital spaces, this contradicts the principle of equity and diversity.

"TikTok can be sexist towards girls - for example, many people will say boys are better than girls and girls are pathetic." (Child aged 11–12, Yorkshire)

⁹ Equality and Human Rights Commission (2011, 2019).

¹⁰ Engineering Design Centre (2017).

¹¹ Our research shows that in 2021/22, only 44% of 52 sampled products and services stated explicit compliance with standards and regulations on non-discrimination and equal access (Livingstone & Pothong, 2023).

¹² UK Government (2021a, b). Although these primarily concern the public sector, they give helpful overviews of what to consider in making any digital service accessible. Making digital services and products accessible is also necessary when providing services in the EU. See European Commission (2022a, b). The EU Accessibility Act Directive (EU) 2019/882 (the EU Accessibility Act) was derived from the UN Convention on the Rights of Persons with Disabilities. It was initially intended to complement the EU Web Accessibility Directive. It was adopted in April 2019, introducing harmonised rules on accessibility for private sector products and services in the EU.

¹³ Livingstone & Pothong (2021a); Digital Futures Commission (2022).

Discrimination may result from digital exclusion, difficult family circumstances or low digital literacy of those from marginalised or disadvantaged groups. Consider minimising cost and cultural barriers to using your product or service, and prioritise digital features that are inclusive, accessible and welcoming to all.¹³

"[I want] Dragon city to be free because if you can't get gems, it'll be harder to play." (Child aged 7–8, Greater London)

Digital spaces are not a level playing field and offer few resources for children to overcome their differences. Yet, technology can help overcome exclusion or discrimination, for instance, by supporting children's relationships with family in cases of separation or crisis.

"Facebook [helps you] find family and friend [that] isn't based on followers." (Child aged 13–14, Yorkshire)

Technological systems based on data analytics or AI may

inadvertently embed forms of discrimination in their operation or outcomes, as ‘when automated processes that result in information filtering, profiling or decision-making are based on biased, partial or unfairly obtained data concerning a child.’¹⁴ If your product or service contains automated decisions, consider including an easily accessible pathway for children and their parents or caregivers to object to such decisions.¹⁵ If profiling is one of your product features, consider turning it off by default.

Designing for equity and diversity means attending to multiple features that can undermine children's rights. Unless to protect them from harm, children should not be excluded because of their age. Nor should they be discriminated against:

On the basis of sex, disability, socioeconomic background, ethnic or national origin, language or any other grounds, and [nor should there be] discrimination against minority and indigenous children, asylum-seeking, refugee and migrant children, lesbian, gay, bisexual, transgender and intersex children, children who are victims and survivors of trafficking or sexual exploitation, children in alternative care, children deprived of liberty and children in other vulnerable situations.¹⁶

There is no silver bullet solution to avoiding discrimination. In anticipating how your product may impact on children, remember that children may ‘use your products or services even if they are not designed for them’ and may ‘use your products and services in unintended ways,’¹⁷ and that children are as diverse as adults.

Put positively, it matters to children that they recognise themselves and feel they can belong to and participate positively and safely in the digital spaces they use. Therefore, our Playful by Design principles include ‘Be welcoming’ and call on designers to:

Prioritise digital features that are inclusive, sociable and welcoming to all, reducing hateful communication and forms of exclusion and reflecting multiple identities.¹⁸

By building equity into digital products and services, designers can contribute to building a more level digital world.

¹⁴ General Comment No 25, para 10. See also Henriques & Hartung (2021) and Hartung (2020).

¹⁵ Article 22 of the UK GDPR says: ‘The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling.’ In addition, Standard 12 of the UK Age Appropriate Design Code (AADC) (ICO, 2021c) requires profiling to be off by default for digital products and services likely to be accessed by children (see also van der Hof et al, 2021).

¹⁶ General Comment No 25, para 11.

¹⁷ Principle 2 of D4CR’s Design Principles (2022).

¹⁸ Livingstone & Pothong (2021a); Digital Futures Commission (2022).

¹⁹ Kidmap (nd).

²⁰ Microsoft (2018)

²¹ Engineering Design Centre (2017).

²² D4CR (nd-a).

²³ W3C (2018).



SUGGESTED DESIGN TOOLS

KIDMAP provides a ‘roadmap’ for designers to create products that are more ‘equitable, diverse and inclusive’ for children in nine actionable steps within designers’ own production process.¹⁹

THE MICROSOFT ‘Inclusive design’ manual includes a design tool and toolkits to support designers to shift their thinking to accommodate diverse user requirements.²⁰

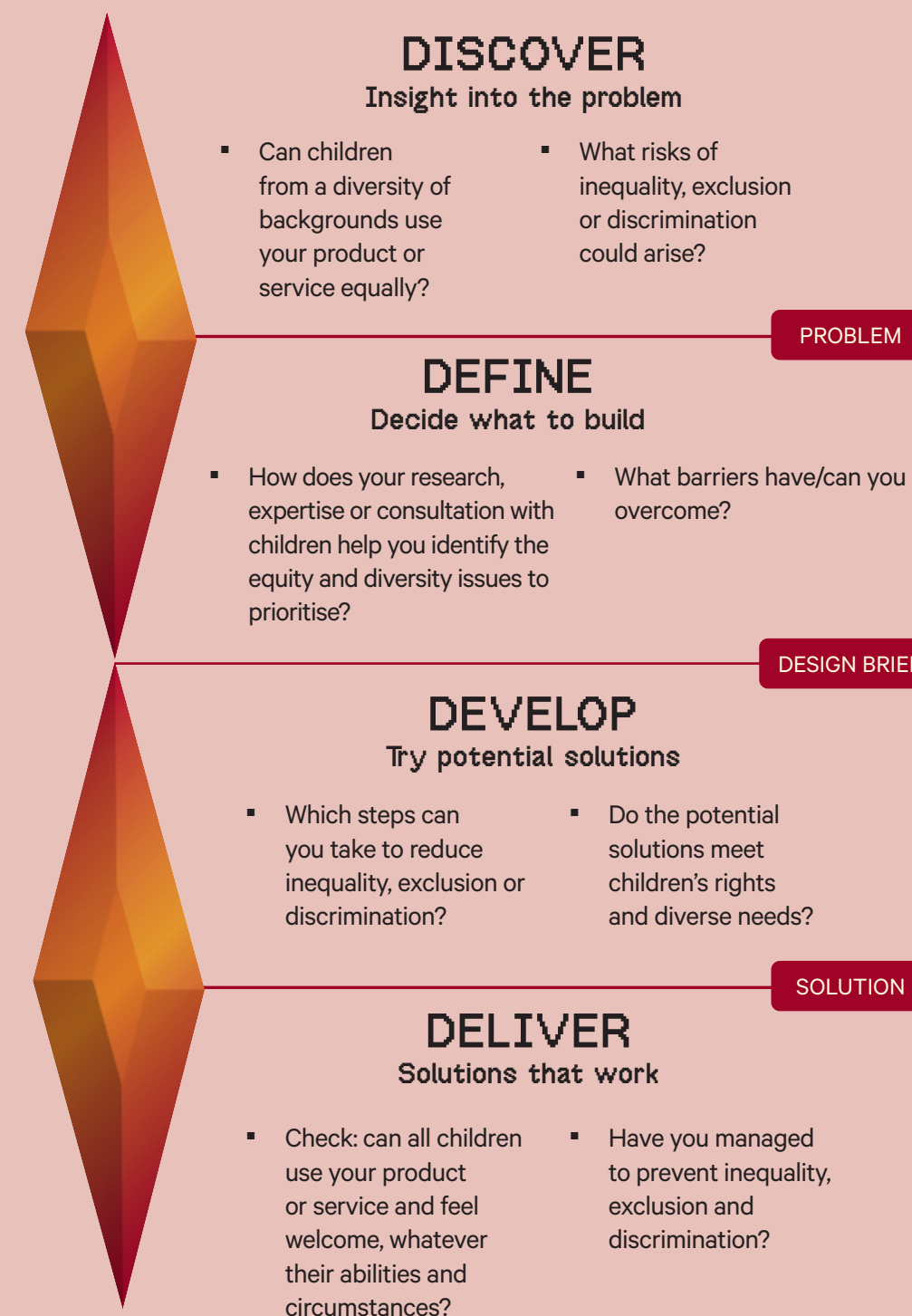
THE ENGINEERING DESIGN CENTRE’s ‘Inclusive Design Toolkit’ offers definitions, performance indicators and links to relevant resources for designers and developers to implement inclusive design.²¹

TOCA BOCA’s definition and application of diversity offers a good practice example of how application developers, especially for toys and games, could think about and design for various aspects of diversity.²²

W3C standards on accessibility show developers and organisations how to enable people with disabilities to participate equally on the Web, overcoming barriers and being accessible to all.²³

How can you make your digital product or service inclusive, welcoming and fair for all?

Here are some questions to ask yourself throughout your design process:



PRINCIPLE 2: BEST INTERESTS



Embed children's best interests in product development and design.

Designing for children's best interests means giving at least equal consideration to children's wellbeing, growth, development and agency as to businesses' interests.²⁴ This principle requires a balancing act across the full spectrum of children's rights as well as the rights of others, also taking into consideration the contexts of use.²⁵

The ultimate purpose of the child's best interests should be to ensure the full and effective enjoyment of the rights recognised in the Convention and the holistic development of the child. Consequently, elements that are contrary to the rights enshrined in the Convention or that would have an effect contrary to the rights under the Convention cannot be considered as valid in assessing what is best for a child or children.²⁶

Crucially, business or design decisions will not be in the best interests of children if the outcomes of such decisions conflict with children's rights, viewed holistically.²⁷ Nor can decisions be reached without consulting children and considering their opinions.

"The committee has been very clear about two things. In order to determine the best interests of the child you need, wherever possible, to take account of what the child's views are about their own best interests. And secondly, that the very definition of best interests must be interpreted or understood within the context of the realisation of children's rights."

(Child Rights Expert)

Despite the technical capability of modern technologies to identify and grasp users' behaviours and requirements, digital providers often claim that they cannot identify the age of their users or distinguish children from adults.²⁸ As a result, digital products and services are often built in ways that neglect children's diverse needs and vulnerabilities.²⁹

²⁴ UNCRC Article 3(1).

²⁵ General Comment No 25, paras 12, 13, 88.

²⁶ General Comment No 14, para 51.

²⁷ Eekelaar & Tobin (2019).

²⁸ Pothong & Livingstone (2022). However, multiple sources of age assurance are in development, some of which respect children's rights (5Rights Foundation, 2021b).

²⁹ Milkaite & Lievens (2020); Lenhart & Owens (2021); Livingstone & Pothong (2021a).

"I wish the world wasn't money hungry, and they purely made apps and games for entertainment only. Listen to people's thoughts."

(Child aged 13–14, Essex)

Making children's best interests 'a primary consideration' in the 'provision, regulation, design, management and use of the digital environment' does not mean innovators cannot profit from their investments.³⁰ It means making children visible in the decision making in your innovation processes by assessing the impact of decisions on a child or children likely to access your product or service, whether they are the intended users or not.³¹

In the search for suitable compromise, authorities and decision-makers must weigh the rights of all those concerned, bearing in mind that the best interests of the child have high priority and are not just one of several considerations.³²

In the digital context, considerations of children's best interests extend to the processing and usage of data obtained from them as they engage in the digital activities inherent in the design of digital products and services.

"TikTok's advertising is bad because the products are bad and make you want it."

(Child aged 11–12, Yorkshire)

Relevant legal frameworks and guidance

Data protection law recognises the special protection that children merit, given their evolving capacities and vulnerabilities:

Children require specific protection with regard to their personal data as they may be less aware of the risks, consequences and safeguards concerned and their rights in relation to the processing of personal data.³³

The UK Age Appropriate Design Code (AADC) translates this legal requirement into 15 standards for digital design, the first of which prescribes the 'best interests of the child' as 'a primary consideration when [designing and developing] online services likely accessed by a child.'³⁴

Children's best interests are cited as foundational in the Australian Online Safety Act 2021 and the Australian *Safety by Design principles*³⁵ (Principle 8: 'The best interests of the user [including children] should be at the heart of the app, game or platform').

³⁰ General Comment No 25, para 12.

³¹ General Comment No 14, para 6(c) (UN Committee on the Rights of the Child, 2013).

³² Vaghri et al (2022, p.26).

³³ Recital 38, UK GDPR (ICO, 2018b).

³⁴ ICO (2021a).

³⁵ Australian Office of the eSafety Commissioner (2019).

The Council of Europe recommends that ‘a balanced assessment of children’s [best] interests’ is ‘at the centre of policymaking and decision-making practices.’³⁶ In this assessment, innovators should account for children’s views, identity, preservation of the family environment, safety, situations that exacerbate the child’s vulnerabilities, children’s rights to health and education, and more.

Likewise, the Dutch Code for Children’s Rights (Code voor kinderechten) prescribes a ‘Child Impact Assessment’ before developing a digital product or service, and throughout the product and service development and life cycle to help make children’s best interests ‘the primary consideration.’³⁷

The UN Committee on the Rights of the Child’s General Comment No 14 sets clear steps for governments and businesses to resolve potential conflicts among rights in children’s best interests. This calls for processes of consultation, evidence gathering, transparency and review.

By incorporating a Child Rights Impact Assessment (CRIA) into the design and development processes, children’s diverse requirements will be better anticipated by innovators. Whether or not children are the intended users of digital products and services, prioritising their best interests should be at the heart of digital innovation and design.³⁸

SEARCH SUGGESTED DESIGN TOOLS

THE INFORMATION COMMISSIONER’S OFFICE (ICO) offers a self-assessment tool to help work out whether data processing as part of product and service operation is in the best interests of the child.³⁹

THE ICO’s framework highlights key children’s rights relevant to data processing, and explains how these rights relate to different aspects of data processing.⁴⁰

DOTEVERYONE offers a Consequence Scanning manual for to help developers anticipate the impact of their product or service on people, including children, and society. This design guide can be used at different stages of a design process.⁴¹

³⁶ Council of Europe (2020, p 31).

³⁷ Principle 1: Make the best interests of the child the primary consideration when designing (van der Hof et al, 2021).

³⁸ Mukherjee et al (2021).

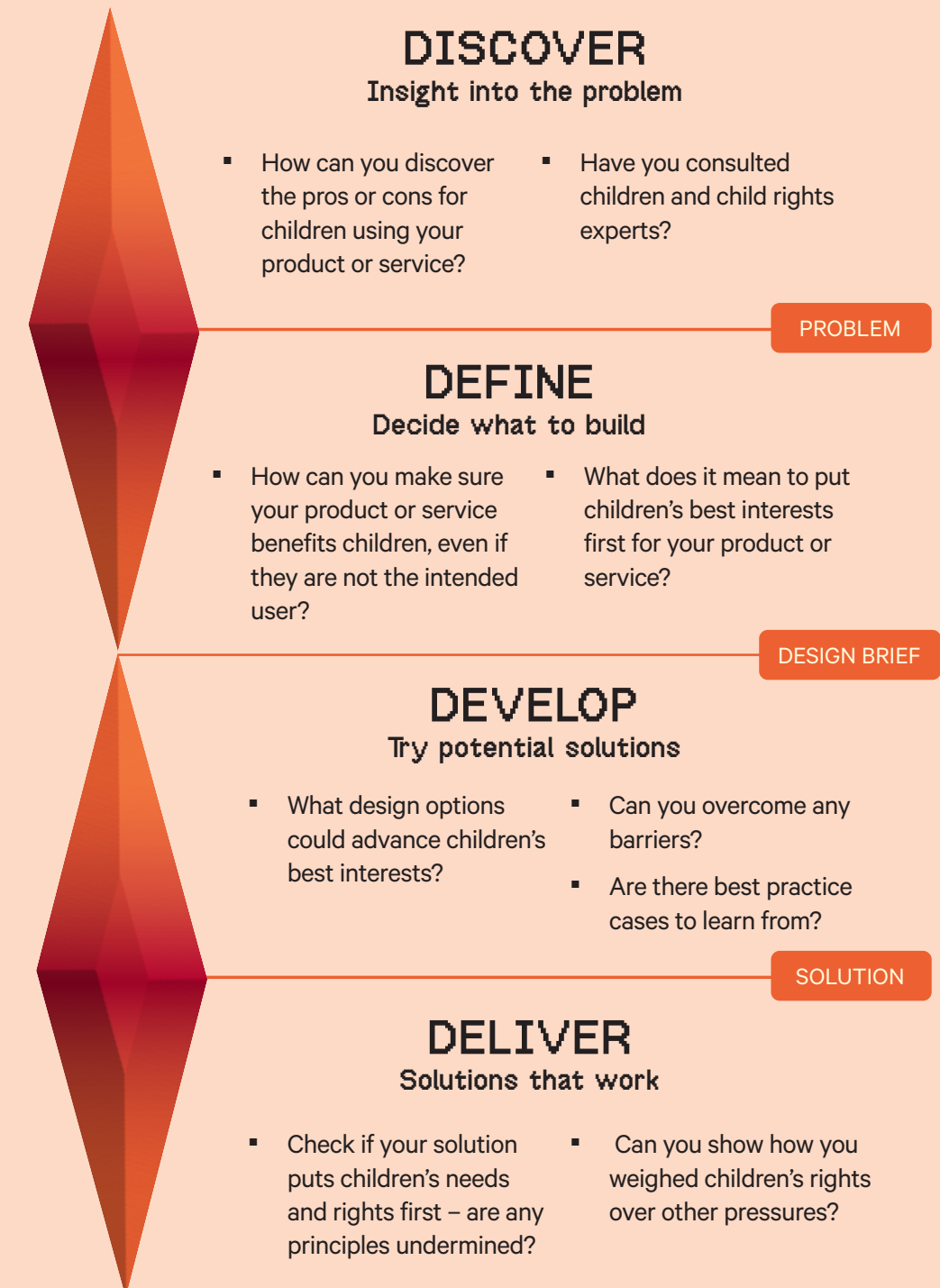
³⁹ ICO (2022c).

⁴⁰ ICO (2022g).

⁴¹ Doteveryone (2019).

How can you make your digital product or service better serve children’s best interests?

Here are some questions to ask yourself throughout your design process:



PRINCIPLE 3: CONSULTATION



Engage and listen to the views of children in product development and design.

Consultation is vital to respect children's voices and experiences in digital innovation. The right to be heard assures children opportunities to 'freely' express their views and have these views given 'due weight' 'in all matters affecting [them]'.⁴² This right is crucial to counterbalance social and cultural biases against recognising children's views.⁴³

By positioning children as design partners, innovators can meaningfully involve them throughout the design and development processes, and demonstrate how their design objectives shaped the outcomes.⁴⁴ It also means creating opportunities for children to have their views heard in relevant decision-making processes.⁴⁵

To be meaningful and effective, consultation with children should be 'transparent and informative, voluntary, respectful, relevant [to the child], child-friendly, inclusive, supported by training, safe and accountable'.⁴⁶ Innovators should flexibly use the forms of communication that work best for children, bearing in mind their age (or 'evolving capacities') and circumstances (including digital inclusion or barriers to participation). Crucially, it should include communicating to children how their views 'influence the outcome of the process' in practice.⁴⁷

"We have the right to speak up, and people should listen."

(Child aged 11–12, Yorkshire)

While engaging children in designing and developing digital technologies is an already established design practice,⁴⁸ it is often only used for products and services intended for children. Yet many children use products and services not intended for them.⁴⁹

Children are generally keen to inform digital innovation. They are often avid users of digital technologies and value being heard about their experiences.⁵⁰ Children are creative and playful; their imagination and playfulness can spark brilliant designs.

Design cases

Listening to children's views in the context of digital innovation is not the same as the kinds of market research that seeks to identify gaps in the market that a product or service can fill.⁵¹ Nor does it refer to user experience (UX) research to test usability or

⁴² UNCRC Article 12.

⁴³ Druin et al (1998); Lansdown (2006); Shier (2010).

⁴⁴ General Comment No 25, para 17.

⁴⁵ General Comment No 25, para 16.

⁴⁶ General Comment No 12, paras 132–4 (UN Committee on the Rights of the Child, 2009).

⁴⁷ General Comment No 12, paras 22–31 (UN Committee on the Rights of the Child, 2009).

⁴⁸ Druin (1999); Markopoulos & Bekker (2003); McNally et al (2016); Hourcade (2020).

⁴⁹ Milkaite & Lievens (2020); Lenhart & Owens (2021); Livingstone & Pothong (2021a).

⁵⁰ Mukherjee & Livingstone (2020).

⁵¹ Trott (2001).

user acceptance.⁵² In a child rights context, engaging children in design aims to enhance the realisation of their rights (safety, play, non-discrimination etc.). It is not enough to aim, instrumentally, to improve the product's potential sales – although companies can, of course, do that as well – because rarely, if ever, does this attend to the 'relevance or materiality of child rights issues'.⁵³

"Well, because we're children, we don't think they'll actually talk to us. They won't take us seriously."

(Child aged 12–13, Essex)

"They should be listening to the users because the users will use it a lot more than the companies will. And they know what the problems are with it... And if someone does suggest something, even if it's a good suggestion, if it stops them from making a certain amount of money, then they won't listen to it. Unless it's almost free to do or it'll gain them more money, then they won't listen to it."

(Child aged 13–14, Essex)

In product development and design, practices that implement children's right to be heard⁵⁴ are grounded in cooperative design⁵⁵ and participatory design.⁵⁶ An example is a two-year robot design project, YOLO, which resulted in a creativity stimulation robot for play times in which children took an active part in all the design stages – discover, define, develop and deliver – and performed various roles, including design partners who made decisions about the robot's behaviour.⁵⁷

When children are cast as 'research partners', they may work side by side with adult design team members to 'gather field data, initiate ideas, test and develop new prototypes' rather than being positioned as 'subjects for teaching' or objects of study.⁵⁸ This means that neither children nor adults make 'all the design decisions.' In short, respecting children's right to be heard involves going beyond merely consulting children and committing to collaborating with them as partners.

Other ways of representing children's needs and rights can be helpful, such as consulting academic experts, civil society organisations, youth organisations, parents and caregivers.⁵⁹ But these alternatives should not be chosen merely out of convenience or cost saving.

⁵² Hassenzahl & Tractinsky (2006).

⁵³ UNICEF (2014, p 11).

⁵⁴ UNCRC Article 12; General Comment No 12, paras 132–4 (UN Committee on the Rights of the Child, 2009).

⁵⁵ Greenbaum & Kyng (1991).

⁵⁶ Mumford & Henshall (1979/1983); Schuler & Namioka (1993); Muller et al (1994).

⁵⁷ Alves-Oliveira et al (2021).

⁵⁸ Druin (1999, p 594).

⁵⁹ UNICEF (2014).

“The BBC are very good because they listen to children.”

(Child aged 11–12, Yorkshire)

Relevant legal frameworks and guidance

The Lundy Model sets out four linked conditions for children’s meaningful engagement in research, business and policy decision-making more widely:⁶⁰

- Safe, inclusive, equal and respectful space for children and young people to form and express their views
- Facilitated participation to ensure meaningful voices
- Audience keen to listen
- Demonstrating how children’s views can influence decisions.

Designing for Children’s Rights also draws innovators’ attention to children’s voices:

“I am and I can, so take my ideas in account first.”

(Karolin, 11 years old, Estonia)⁶¹

Note that directly engaging children involves ethical considerations – such as recruiting participants, supporting and ensuring the meaningful engagement of children and young people, and obtaining meaningful consent from a child and their parents or caregivers.⁶²

⁶⁰ Lundy (2007); Hub na nÓg (2021).

⁶¹ Principle 1 in Designing for Children’s Rights V. 2.0 (D4CD, 2022), and Principle 2 of the Dutch Code for Children’s Rights (Code voor kinderechten) (van der Hof et al, 2021).

⁶² CO:RE Compass for Research Ethics, at <https://core-evidence.eu/compass-for-research-ethics>

⁶³ The Joan Ganz Cooney Center (nd).

⁶⁴ ICO (2022d).

⁶⁵ Wetenschapsknooppunt TU Delft (nd).

⁶⁶ Better Internet for Kids (2021).

⁶⁷ KidsKnowBest & The LEGO Group (2022).

⁶⁸ DeCID (nd).



SUGGESTED DESIGN TOOLS

THE JOAN GANZ COONEY CENTER’S ‘Playtest with Kids’ toolkit offers diverse design methods for engaging children in different design activities at various stages of design.⁶³

THE ICO’S guide lists things to do and consider when preparing for child engagement in a design process. It also advises on safe and ethical methods for engaging children.⁶⁴

WETENSCHAPSKNOOPPUNT TU Delft’s toolkit offers resources for designers and design students to engage children as ‘co-design partners’ throughout the whole design cycle, from problem definition, exploring solutions, ideation to prototyping and testing.⁶⁵

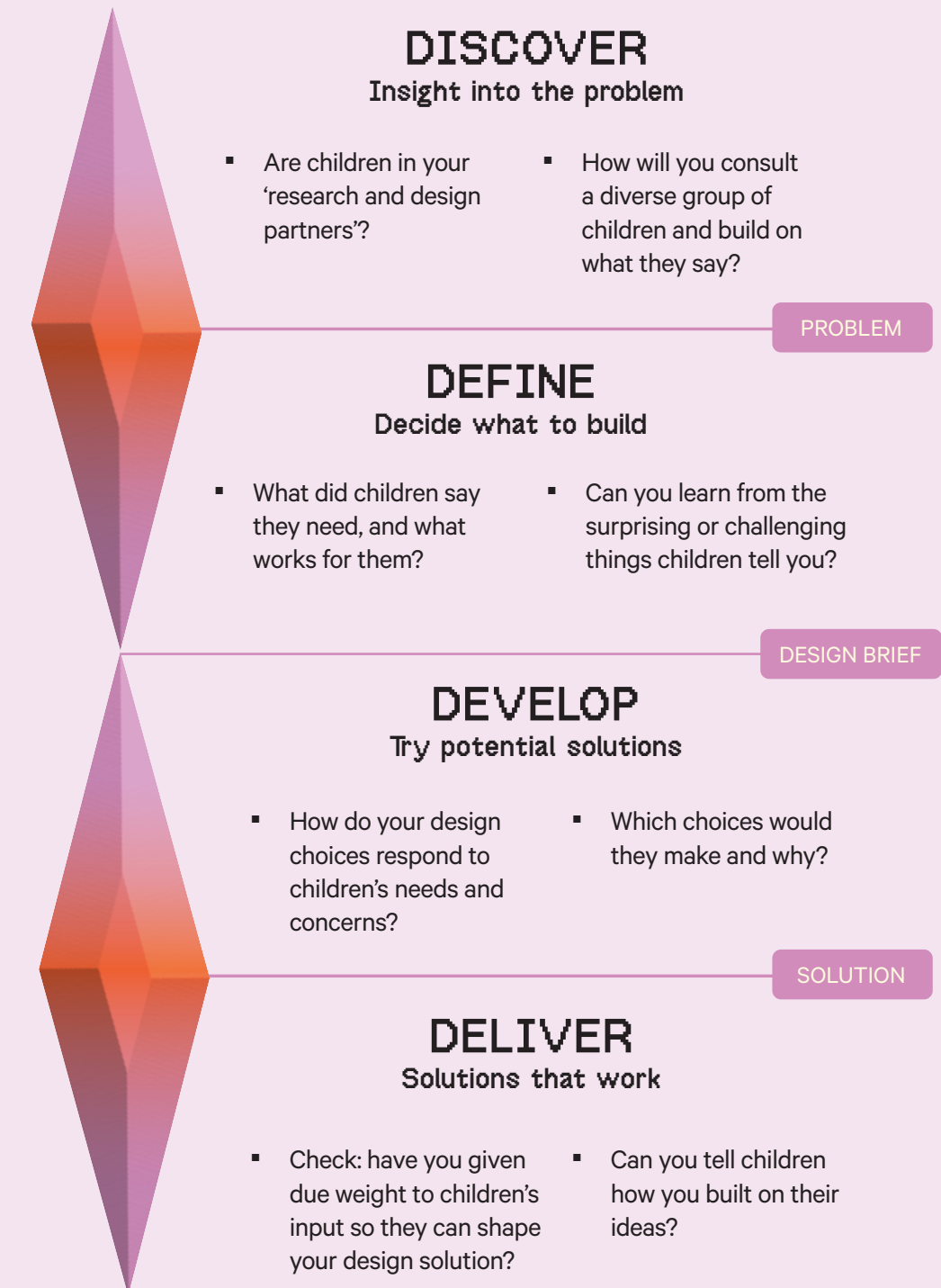
AGE-APPROPRIATE DESIGN WITH YOUTH offers a best practice guideline for meaningful youth participation based on the Lundy Model of participation (2007).⁶⁶

KIDSKNOWBEST’S Kids Included report offers practical tools and good practice for meaningful child participation for innovators. It integrates models of child participation used by major companies such as Honda, Microsoft, Sesame Workshop and more.⁶⁷

DECID’S ‘Children Participation and Design’ is a collection of reports, research and toolkits for engaging children in research and design in tried and tested ways.⁶⁸

How can you make your digital product or service better serve children’s best interests?

Here are some questions to ask yourself throughout your design process:



PRINCIPLE 4: AGE APPROPRIATE



Develop products that are age appropriate by design and consider using age assurance.

Age-appropriate products and services depend on children's developmental milestones and life circumstances. Innovators must consider the role of parents and caregivers, states and businesses in realising children's rights to provision, participation and protection in accordance with the child's evolving capacities and the gradual acquisition of autonomy.⁶⁹

This principle draws together two central issues in children's rights:⁷⁰

- The concept of the child's evolving capacities recognises the gradual process through which children acquire greater competencies and understanding, along with the necessary transfer of responsibility for decision making from the parents or caregivers to the child.⁷¹
- The obligations of the state include providing support and guidance to parents and caregivers so that they can protect their child's rights. In a digital world, parental responsibilities include mediating the use and impact of technologies, and the state – and businesses – play a key role in supporting this.⁷²

Relevant legal frameworks and guidance

The principle of 'age appropriate' is interpreted and implemented in various ways, depending on the context. For example, the UK Age Appropriate Design Code (AADC) prescribes 15 legally binding standards to make data processing appropriate for children of different ages.⁷³ The notion of age-appropriate digital innovation in the IEEE Standard for an Age Appropriate Digital Services Framework is based on the 5Rights Principles for Children:⁷⁴

- Recognising child users and meeting their needs and diversity
- Upholding children's rights
- A child-centred approach to data use
- Moderation and redress
- Presenting published terms in age-appropriate formats.

This standard emphasises the protection and provision aspects of children's rights in relation to the digital environment.

⁶⁹ General Comment No 25, paras 15, 19–21, 84–6.

⁷⁰ UNCRC Articles 5, 18; the child's evolving capacity and the responsibilities of their 'parents' (including caregivers and responsible family members).

⁷¹ This is consistent with theories of child development: see Vygotsky (1978); Papert & Harel (1991); Thelen & Smith (1998); Piaget & Inhelder (2008).

⁷² UNCRC Article 18.

⁷³ ICO (2020).

⁷⁴ IEEE (2021).

"My mum and dad only really think about games that are appropriate for me if they're appropriate for kids. I think that I should have some choice in what's appropriate for me. Also, once, my mum gave me a game that was appropriate for my age, and I thought it was really, really boring."

(Child aged 7–8, Greater London)

Design cases

In design contexts, age appropriateness reflects the child rights' concept of evolving capacity. It manifests strongly in relation to design for play and learning:

Encourage curiosity, and consider children's evolving capabilities based on age and development, personalities, skills and interests.⁷⁵

In child–computer interaction (CCI), child development theories inform the notion of age-appropriate computing and interactive systems based on usability and impact on a child.⁷⁶ However, age-appropriate digital innovation goes beyond safety features or ensuring usability for specific age groups. An age-appropriate experience will facilitate children's experiences of all kinds – easier participation, learning and wellbeing, for instance.⁷⁷

Digital innovators need to recognise the complexities of the transition from childhood to adulthood. These vary considerably across individuals and circumstances, and this very transition can increase children's vulnerabilities, risking infringement of their rights.⁷⁸

"When you're younger, you don't understand what's meant to mean something. Like maybe someone said something, and you're not sure what it's meant to mean, so you go along with it. But as you get older, you understand more stuff."

(Child aged 12–13, Essex)

This may mean having in place age-assurance mechanisms or age gating to prevent access or usage by underage users of high-risk products or services. Designers and developers need to test the effectiveness of their age-assurance and gating mechanisms against unintended uses and protect children's privacy and other rights. To determine what age-assurance mechanism is appropriate for your product or service, refer to 5Rights Foundation's assessment of different age-assurance technologies.⁷⁹

⁷⁵ Principle 4 of D4CR's Design Principles (2022).

⁷⁶ Bekker & Antle (2011); Hourcade (2020).

⁷⁷ Digital Childhood (Kidron & Rudkin, 2017) helps innovators grasp age bands and their implications in the digital world.

⁷⁸ General Comment No 20, paras 8–10, 26 (UN Committee on the Rights of the Child, 2016).

⁷⁹ 5Rights Foundation (2021b).

“I believe that age restrictions should become harder to bypass as I see many young children below the age of 12. You also should look into higher censorship as there have been many events in the past of extremely gruesome clips: a guy shooting himself, a guy getting hit... and children playing with guns.”

(Child aged 12–13, Essex)

“All ages should be protected, not just certain ages.”

(Child aged 13–14, Yorkshire)

To embed children’s rights to provision, protection, participation and parental guidance according to children’s evolving capacities, age-appropriate innovation means prioritising features, functionality, content and business models that are compatible with children’s evolving capacities and agency (see Principle 11). Recognising children’s and adolescents’ vulnerabilities, age-appropriate products and services should not put children’s wellbeing, privacy or other rights at risk, but offer children opportunities for growth and development in ways compatible with their various developmental requirements.

⁸⁰ Save the Children Finland (2020).

⁸¹ ICO (2022h).

⁸² TU/e (Bekker, Valk & Eggen, 2014).

⁸³ BBC (2016).



SUGGESTED DESIGN TOOLS

SAVE THE CHILDREN’s Child-Centred Design toolkit offers guidance on how to design better services for children, including a design process and methods. It is based on the process or service design, children’s rights and child-centred design practice.⁸⁰

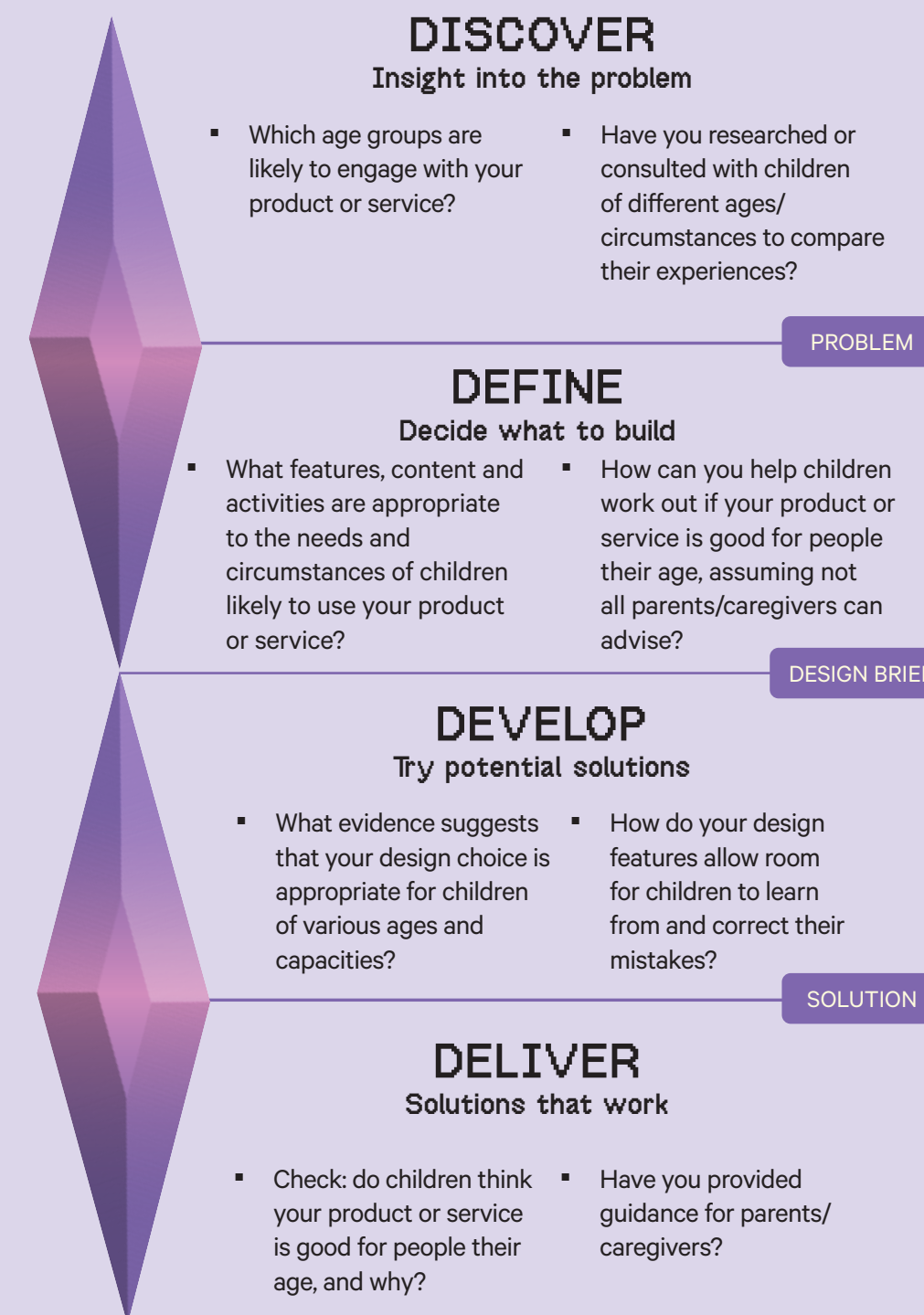
THE ICO’s design guide focuses on designing privacy information to meet the diverse requirements of children from different age ranges, based on children’s needs, behaviours and the risks they can be exposed to. It also offers some design tips on what works.⁸¹

TU/E’s toolkit offers design considerations to inform play design decisions, based on forms and stages of play, open-ended play and playful experience perspectives.⁸²

THE BBC’s design guide offers six principles for designing better digital experiences for children of different ages.⁸³

How can you make your digital products and services age appropriate?

Here are some questions to ask yourself throughout your design process



PRINCIPLE 5: RESPONSIBLE



Comply with legal frameworks, provide remedies as needed and conduct a Child Rights Impact Assessment.

Responsible digital innovation means businesses should keep up with ethical, rights-based and legal frameworks and guidance so that children's digital lives are enabled and empowered by design.

The principle of responsibility emphasises that relevant stakeholders (or, in child rights language, 'duty bearers'):⁸⁴

- Know of and comply with laws, regulations, industry standards and other measures to ensure the realisation of children's rights
- Provide children with accessible and safe pathways to meaningful remedies if things go wrong.

"You and your parents [have the responsibility to keep children safe]. But also, the creators of the app like the creator of YouTube, know that kids are going to watch that now... Then, the app maker should have another setting for kids."

(Child aged 9–10, Greater London)

Relevant legal frameworks and guidance

There are various laws, regulations and standards that digital innovators need to consider, including data protection and privacy laws, non-discrimination, product safety and consumer protection laws, among many others.⁸⁵

For example, digital providers operating in the UK must ensure their processing of personal data complies with the UK General Data Protection Regulation (GDPR)⁸⁶ and Data Protection Act 2018. Ensuring compliance with these laws will help compliance with the Privacy and Electronic Communications Regulations (PECR), which set out rules 'on the use of cookies and other technologies which rely on access to user devices, and on electronic marketing messages'.⁸⁷ The AADC is the UK statutory code of practice for designers and developers of digital products and services likely accessed by children. It takes a child rights perspective.⁸⁸

"Apps have a responsibility to not leak data or personal information."

(Child aged 12–13, Essex)

⁸⁴ UNCRC Articles 4, 42. General Comment No 25, paras 22–7, 33, 35–9, 43–9, 123–4. General Comment No 5, paras 6, 24–5 (UN Committee on the Rights of the Child, 2003; UN, 2011).

⁸⁵ Livingstone & Pothong (2023).

⁸⁶ ICO (2021b).

⁸⁷ ICO (2020, p 11, 2018a).

⁸⁸ See Principles 2 and 4; see also ICO (2020).

The UK Equality Act 2010 places a duty on service providers to make their services accessible and inclusive.⁸⁹ To comply with the UK Equality Act 2010,⁹⁰ digital innovators must take steps to provide equal experiences to all children using their products or services. Particular groups of children should not be disadvantaged compared to other children because of their protected characteristics (e.g., learning disabilities). This includes making reasonable adjustments, and anticipating unintended discrimination or exclusion (e.g., being filtered out of a recruitment process). This is also important for the curation and data labelling for machine learning (ML) and artificial intelligence (AI) in any product or service.

"Snapchat could make it more child-friendly so random people can't just add you and can't say mean things." (Child aged 13–14, Yorkshire)

The UK Online Safety Bill sets out responsibilities for digital providers to keep children safe online.⁹¹ Protection of children against commercial (economic) exploitation (e.g., by disguising providers' promotion of products, services or in-app and in-game purchases) is supported by the UK Consumer Protection from Unfair Trading Regulations 2008, SI 2008/1277(CPUTR 2008) and the Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013, SI 2013/3134 (CCR 2013).⁹² The CCR 2013, Consumer Rights Act 2015 and CPUTR 2008 prohibit unfair and misleading commercial practices and coercive sales techniques.⁹³

Relevant to some products and services are Ofcom's On Demand Programme Service Rules and video-sharing platform regulation,⁹⁴ and the EU General Product Safety Directive 2001/95/EC.

Multiple voluntary codes of practice, standards and guidelines offer guidance for innovators. For example, the Broadband Commission's Child Online Safety report requires 'built-in protections'⁹⁵ against the 4Cs of online risks⁹⁶ using relevant technologies, such as blocking, filtering and web crawlers.

There is also guidance for innovators on how to provide safe and accessible pathways to meaningful remedies. This recommends taking an active role, for instance, by establishing 'company-based grievance mechanisms' that include 'consumer or user complaints processes, terms of service enforcement processes ... systems for handling privacy related issues ... and for monitoring and enforcing community conduct standards (including content moderation)'.⁹⁷ Conduct monitoring is crucial to ensuring user safety in social media service provision:

Social media providers should maintain a clear and accessible reporting process to enable individuals to notify social media providers of harmful conduct.⁹⁸

⁸⁹ The Equality Act 2010 Statutory Code of Practice (2010) provides further guidance for 'service providers' (e.g., website operators). See Equality and Human Rights Commission (2011).

⁹⁰ See Principle 1 and the UK Equality Act 2010.

⁹¹ See Principle 8 and the Online Safety Bill (subject to change).

⁹² See Principle 11; Lievens et al (2019); and CPUTR 2008 (amended by the Consumer Protection [Amendment] Regulations 2014, requiring businesses to trade fairly and honestly with consumers).

⁹³ Conway (2022a, b).

⁹⁴ Ofcom (2017, 2021).

⁹⁵ Broadband Commission (2019, p 23).

⁹⁶ The 4Cs of online risks are content, contact, conduct and contract (Livingstone & Stoilova, 2021).

⁹⁷ B-Tech (2021).

⁹⁸ DCMS (2019, p.4).

For company-based grievance mechanisms to be effective, the UK Government requires (1) a procedure to enable remediation and (2) a meaningful outcome for those seeking redress – in this case, children.⁹⁹

In line with the UN Guiding Principles criteria for effective redress mechanisms, the Australian Safety by Design principles (Principle 2.2) recommend that innovators:

Establish clear protocols and consequences for service violations that serve as meaningful deterrents and reflect the values and expectations of the user-base.¹⁰⁰

Crucially, redress mechanisms for children need to be:

- Safe: children are free from fear of negative consequences as a result of complaining
- Accessible: easy for children to use
- Accountable: children get effective remedy and redress.

Similarly, the IEEE Standard for an Age Appropriate Digital Services Framework sets out six actions for providing effective moderation and redress:¹⁰¹

- Provide prominent, accessible and easy-to-use tools to help children and parents/caregivers seek redress
- Provide children and parents/caregivers access to expert advice and support where needed
- Have clear penalties applied fairly and consistently
- Offer opportunities to appeal decisions and escalate unresolved appeals to expert third parties or regulators
- Reasonable response times
- Provide children and parents/caregivers with an opportunity to correct their digital profile/footprint and termination rights.

Navigating the complex legal, regulatory and standards landscape applicable to digital products and services can be daunting for innovators, especially start-ups. So the first port of call could be a trade or industry association, if you are a member. For example, the Association for UK Interactive Entertainment (UKIE) provides guidance on the application of relevant regulations for its members.¹⁰²

A Child Rights Impact Assessment (CRIA) is a tool commonly used in policymaking processes to anticipate the likely impact on children. The CRIA has eight practical steps for innovators to follow and is now being adapted and applied to digital innovation by a growing number of businesses.¹⁰³



SUGGESTED DESIGN TOOLS

THE ICO's toolkit offers best practice for data protection AI based on how the ICO applies data protection law to AI.¹⁰⁴

THE OECD guidelines for digital service providers aim to support digital service providers when they take actions that may directly or indirectly affect children in the digital environment in determining how best to protect and respect their rights, safety and interests.¹⁰⁵

ARTEFACT GROUP's digital pack of design cards offer provocations that help designers perceive the unintended consequences of technologies in development as well as opportunities for positive changes.¹⁰⁶

RESPONSIBLE DATA FOR CHILDREN's (RD4C) self-guide training material unpacks how to apply the RD4C principles and tools to help digital innovators embed children's rights at the heart of their data processing.¹⁰⁷

UNICEF's guide to Child Rights Impact Assessment is intended for local authorities designing child-friendly cities, but it can be easily applied to designing digital products and services.¹⁰⁸

⁹⁹ Principle 25 (UN, 2011); DCMS (2019).

¹⁰⁰ Australian Office of the eSafety Commissioner (2019).

¹⁰¹ IEEE (2021).

¹⁰² UKIE (2014).

¹⁰³ Mukherjee et al (2021); Sylwander (2001).

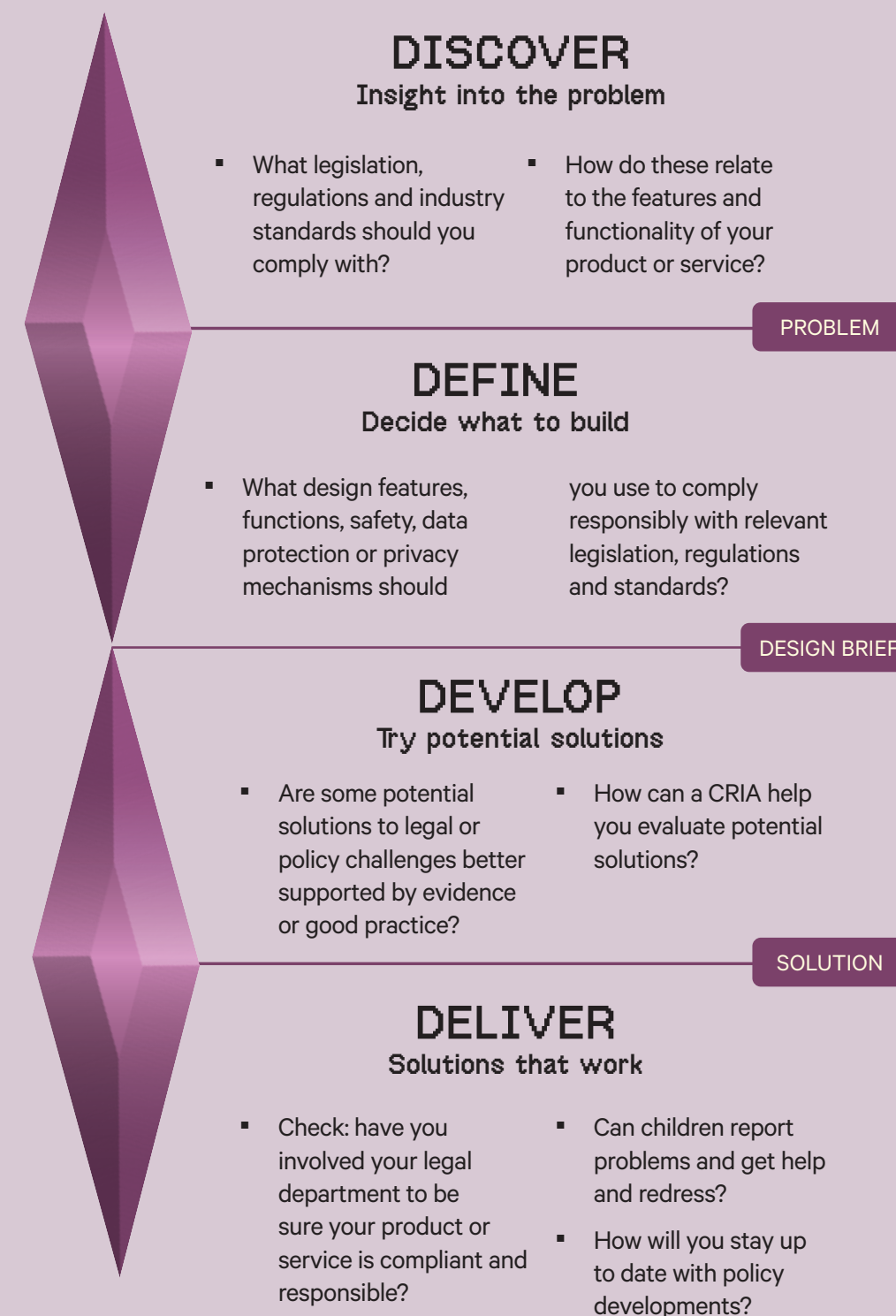
¹⁰⁴ ICO (2022a).

¹⁰⁵ OECD (2021a).

¹⁰⁶ Artefact Group (nd).

How can you be responsible when designing your digital products and services?

Here are some questions to ask yourself throughout your design process



¹⁰⁷ RD4C (2022).

¹⁰⁸ UNICEF (2021).

PRINCIPLE 6: PARTICIPATION



Enable children's participation, expression and access to information.

Innovating for child participation in a digital world means creating opportunities for children to form opinions, impart and receive diverse information, and freely join social and political activities. Although these are sometimes overlooked or sacrificed for safety reasons, children's civil rights and freedoms are vital for their participation in a digital society, no less than for adults.¹⁰⁹

The principle of participation draws together multiple rights.¹¹⁰ These concern children's civil rights and freedoms as societal actors:

- Freedom of expression, including the right to free speech, opinions and political views: both for themselves and to engage with those of others, subject to the rights of others, national security and public order.
- Freedom of thought: the ability to form one's own opinion, decisions and choice of faith, and have this respected and supported, proportionate to the child's evolving capacities, and not be manipulated, nudged or punished.
- Freedom of association and peaceful assembly: the ability to participate freely and safely in social and political activities, including child-led activism, without surveillance or undue restrictions.
- Information access: meaning that children can both access and contribute to content of all kinds; this should be easy to find, in their languages, from a plurality of sources and be beneficial in multiple ways; any restrictions should be transparent and in children's best interests.

Participation includes and goes beyond the right to be heard in the process of digital innovation (see Principle 3: Consultation).¹¹¹ In Principle 6, we focus on participating in society through digital means.

Every child is entitled to express and impart views without restriction in respect of age or capacity to any audience or indeed, to none, and on whatever issue they choose.¹¹²

Digital innovators can harness the generative power of design to open opportunities for constructive self-expression, creativity and exploration, and promote access to diverse information:

A child's wellbeing, social life, play, creativity, self-expression and learning can be enhanced when collaborating and sharing with others. Provide children with safe experiences, both online and in person, that help develop relationships and social skills.¹¹³

¹⁰⁹ UNCRC Articles 13, 14, 15, 17; General Comment No 25, paras 50–66.

¹¹⁰ These include birth registration so the child is officially recognised and can access core services, including health, education and welfare, and the right to preserve personal identity – UNCRC Articles 7, 8; General Comment No 25, para 79.

¹¹¹ UNCRC Article 12.

¹¹² Vaghri et al (2022, p.69).

¹¹³ Principle 5 of D4CR's Design Principles (2022).

“Participation is like if a friend invites you, you can participate. If a friend invites you to something like a sports tournament, you can participate in it with loads of other friends.”

(Child aged 7–8, Greater London)

Design cases

Digital products and services can facilitate children's participation in social and political activities, freedom of expression and access to information. But they can also undermine children's participation, for instance, by facilitating chilling effects through surveillance or using AI-driven recommendation systems that filter, select and serve information to a child in restrictive or distorting ways, or even destructive ways.¹¹⁴

“I like the bit where it says you have the right to be you because sometimes social media can make you feel like you can't be you. You have to be someone else and be like other people.”

(Child aged 11–12, Yorkshire)

Livestreaming platforms such as Twitch, which facilitate freedom of expression and access to information, have sometimes been abused by content creators or audiences to cause life-threatening harm to an opponent or targeted streamers through prank calls.¹¹⁵

“Well, it's good and bad. [Discord is] good because you can have many friends there. And you can join servers which is a bunch of people that you want to talk to... But it can be bad because there are servers on there that are ... are actually quite illegal.”

(Child aged 13–14, Essex)

In the global children's consultation on General Comment No 25,¹¹⁶ children spoke of how the hostility they experience online inhibits their freedom of expression, information, assembly and association.

Recognising children's rights to participate in digital spaces that many see as ‘for adults’ or ‘for the general public’ remains a challenge that designers could help overcome rather than perpetuate. Although children's ‘right to freedom of expression is

¹¹⁴ Naughton (2022).

¹¹⁵ Dodgson (2022).

¹¹⁶ Third & Moody (2021).

not an absolute right', it can only be restricted in ways 'prescribed by law', 'legitimate' and 'necessary in a democratic society'.¹¹⁷

"The right, I mean, it could mean the right that everybody should be able to express their opinion on what they think on it. But it could also be wrong, as there could be people that aren't using their real opinion and are just going to say something to try and hurt others."

(Child aged 12–13, Essex)

Giving power to children in public and social spaces to 'block' unwanted contacts without them knowing is one way of allowing children to 'distance [themselves] from those [they] don't want to have contact with'. Instagram offers this control feature in the newly updated app.¹¹⁸

Innovators should try to anticipate both the intended and unintended use of their products and services and ensure that efforts to protect children do not come at the cost of realising their other rights, including information, expression and assembly. Likewise, efforts to facilitate information access, expression and assembly should not come at the cost of children's safety, privacy or wellbeing.

¹¹⁷ Council of Europe (2020).

¹¹⁸ Instagram (2022).

¹¹⁹ European Commission (2023).

¹²⁰ Rood & Madden ((2022).

¹²¹ Positive Online Content Campaign (nd).



SUGGESTED DESIGN TOOLS

THE BETTER INTERNET FOR KIDS

leaflet sets out in a child-friendly manner the aims of the European strategy for a Better Internet for Kids (BIK+) that aims for children and young people to be protected, empowered and respected whenever they go online, and that they can access and enjoy what the online world has to offer.¹¹⁹

THE JOAN GANZ COONEY

CENTER's Understanding Youth report offers a framework for creating media content for various distribution platforms, based on insights from young people, research and industry practices.¹²⁰

THE EUROPEAN COMMISSION's

'Positive Online Content Campaign' provides a criteria checklist to help content providers when developing new content and services, to ensure that their products are fit for purpose and adequate measures are taken to protect children from risk of harms online. This also helps those choosing online experiences for children.¹²¹

How can you make your product or service support children's participation in digital public spaces?

Here are some questions to ask yourself throughout your design process

DISCOVER

Insight into the problem

- How can you facilitate children's free expression and access to information and people they wish to engage with?
- Does your research and consultation with children show ways for your product or service to enhance their participation in a digital world?

PROBLEM

DEFINE

Decide what to build

- Bearing in mind the risk of harm, can you optimise children's opportunities to participate in the digital world without undue restrictions?
- Children love participating in child-specific and general digital spaces – can you enable either or both?

DESIGN BRIEF

DEVELOP

Try potential solutions

- How effectively is your design choice enabling children's civil rights and freedoms in a digital world?
- What barriers do you face, and can best practice cases help you overcome them?

SOLUTION

DELIVER

Solutions that work

- Check: does your design solution allow children to discover diverse information, free expression and participation without undue risks?
- Are you sure that your efforts to protect children do not compromise their rights to freedom of information, expression and identity?

PRINCIPLE 7: PRIVACY



Embed privacy-by-design and data protection in product development and use.

Privacy-respecting innovation starts with business models that align with lawfulness, fairness, transparency, data minimisation, purpose and storage limitations. Privacy-by-design manifests through design features that give users meaningful control over the visibility, access and use of personally identifiable data. Privacy also requires security measures to prevent unauthorised access to data.

The principle of privacy-by-design draws on children's right to the protection of privacy and image, which prescribes responsible handling of personal data, including:¹²²

- Deployment of appropriate security measures to guard against unauthorised access to personal data
- Compliance with data protection principles of lawfulness, fairness, transparency, data minimisation, accuracy, purpose and storage limitation
- Respect for children's agency, dignity and safety in the sharing and use of children's data.

Making your product or service privacy respecting by design does not mean a blanket ban on data sharing. Nor does it mean added value cannot be generated from data processing. Baking privacy into digital products and services by design also means processing data fairly in a way that children would reasonably expect, collecting only the data necessary for the provision of your service, being transparent about how you process the data, respecting users' choices, and keeping the data safe from unauthorised access only for the duration for which you need it.

“Well, the thing is that those apps say that we have a right to privacy and then still allow data and sell it to random people.”

(Child aged 12–13, Essex)

“You shouldn't say your email address on Roblox ... because people can find a way to try to kidnap you.” (Child aged 7–8, Greater London)

Relevant legal frameworks and guidance

Children require specific protection of their personal data as they

¹²² UNCRRC, Article 16; General Comment No 25, paras 67–78.

may be less aware of the risks involved, and less able to claim their rights.¹²³

Without transparency and informed consent from the child and their parents or legal guardians, data practices that constitute commercial threats to children's privacy are likely in breach of the UK Data Protection Act 2018, the UK GDPR and the UK AADC. These may breach the principles of lawfulness, fairness, transparency, purpose limitation and data minimisation in the UK Data Protection Act 2018,¹²⁴ UK and EU GDPR¹²⁵. Profiling of data obtained from child users is also in breach of Standard 12 of the UK AADC, which requires options that use profiling to be switched 'off' by default. The Irish Fundamentals for a Child-Oriented Approach to Data Processing (the Fundamentals) offer clarification on digital innovators' obligations under the EU GDPR and 14 actions to enhance the protection of children's privacy in the digital environment.¹²⁶

Other international voluntary standards also provide technical measures for digital innovators to comply with data protection laws, particularly principles of accuracy, integrity and confidentiality¹²⁷ in ISO 27001,¹²⁸ the principles of purpose limitation, integrity and confidentiality¹²⁹ in ISO27701,¹³⁰ and requirements for privacy-by-design in ISO 31700.¹³¹ Taking a slightly different focus, the IEEE Standard for an Age Appropriate Digital Services Framework advises against specific design features – 'inappropriate commercial nudging, profiling or conditioning'.¹³²

Specific to digital products and services used in health and social care, the UK Code of conduct for data-driven health and care technology advises the public sector to 'consider only entering into commercial terms in which the benefits of the partnerships between technology companies and health and care providers are shared fairly'.¹³³ Irrespective of application domains, digital providers should conduct a child rights-oriented data protection and privacy impact assessment to anticipate and mitigate the adverse impact of data processing on children and their rights.¹³⁴

Design cases

Threats to children's right to privacy and data protection in the digital environment manifest in three dimensions: interpersonal, institutional and commercial.¹³⁵ The interpersonal aspect of privacy that manifests through design features relates to friend or contact recommendation features based on various information sources, including shared contacts and profile information that users input to the systems and their interaction activities.¹³⁶

Online activity monitoring in parental control apps can also threaten children's interpersonal privacy and even pose risks to children's safety, as they request permission to read children's calendars, contacts, audio records and the user's exact location.¹³⁷ Requests for parental consent for children to access 'preventative or counselling

¹²³ Recital 38, EU GDPR.

¹²⁴ Part 4, Chapter 2, The data protection principles in the Data Protection Act 2018.

¹²⁵ Article 5, UK and EU GDPR.

¹²⁶ Data Protection Commission (2021).

¹²⁷ Article 5(1)(d) and 5(1)(f), UK GDPR.

¹²⁸ ISO Standards (nd-a).

¹²⁹ Article 5(1)(b), UK GDPR.

¹³⁰ ISO Standards (nd-b).

¹³¹ ISO Standards (2023); see also IAPP (2023).

¹³² Process 10, IEEE (2021).

¹³³ It requires transparency 'about the limitations of the data used', 'types of algorithm being developed or deployed', 'ethical' consideration and the validation of the algorithmic performance. See Principles 6 and 7, Code of conduct for data-driven health and care technology (Department of Health and Social Care, 2018).

¹³⁴ Council of Europe (2020); van der Hof et al (2021).

¹³⁵ General Comment No 25, para 67.

¹³⁶ Cheng et al (2019).

¹³⁷ Pangrazio (2021).

services' also undermine children's privacy.¹³⁸

"TikTok isn't that good because anyone can add or see your account unless it's on private."

(Child aged 11–12, Yorkshire)

The processing of data about children by public authorities, such as schools, and the onward sharing of data with other public and private stakeholders, as well as data processing through children's uses of EdTech in schools, could also threaten children's privacy if not handled with care.¹³⁹ Commercial threats include profiling users' data to inform design decisions to prolong user engagement, manipulate users' behaviours or serve users with targeted marketing or other forms of data monetisation.¹⁴⁰ Data processing, even as part of the performance of digital technologies (e.g., health wearables), can have latent effects, resulting, for example, in the denial or adjustment of health insurance (see the case of Fitbit¹⁴¹).

"It'd be better for my privacy if apps don't use or keep my number/personal information."

(Child aged 13–14, Yorkshire)

Instead, help children and caregivers keep control over children's data. Give them choices about what data to share, and tell them how their data will be used.¹⁴²

Innovators should align their business models with data protection principles to make their data processing lawful, fair, transparent and specific to the original purpose. Remember to take only the data you need, keep the data only as long as needed, and ensure that children and parents/caregivers know your policy and how to seek remedy.

¹³⁸ General Comment No 25, paras 76–8.

¹³⁹ General Comment No 25, para 67; Day (2021); Day et al (2022); Hooper et al (2022).

¹⁴⁰ See Principle 11 (Agency); UNICEF (2019, pp 10, 23); Williamson (2019); Zuboff (2019); Barassi (2020); Bengtsson et al (2021); Dinsmore & Pugh (2021); Dodd et al (2021); Mascheroni & Siibak (2021); Atabey et al (2023).

¹⁴¹ Raber et al (2019).

¹⁴² Principle 8 D4CR's Design Principles (2022).

Q SUGGESTED DESIGN TOOLS

The **ICO's** 'Privacy in the product design lifecycle' specifically addresses digital innovators as data controllers and offers guidance on how to implement data protection by default and by design.

The **ICO's** 'Data privacy moments' tool helps teams map risks to children's privacy in the context of their user journeys and to come up with potential solutions.

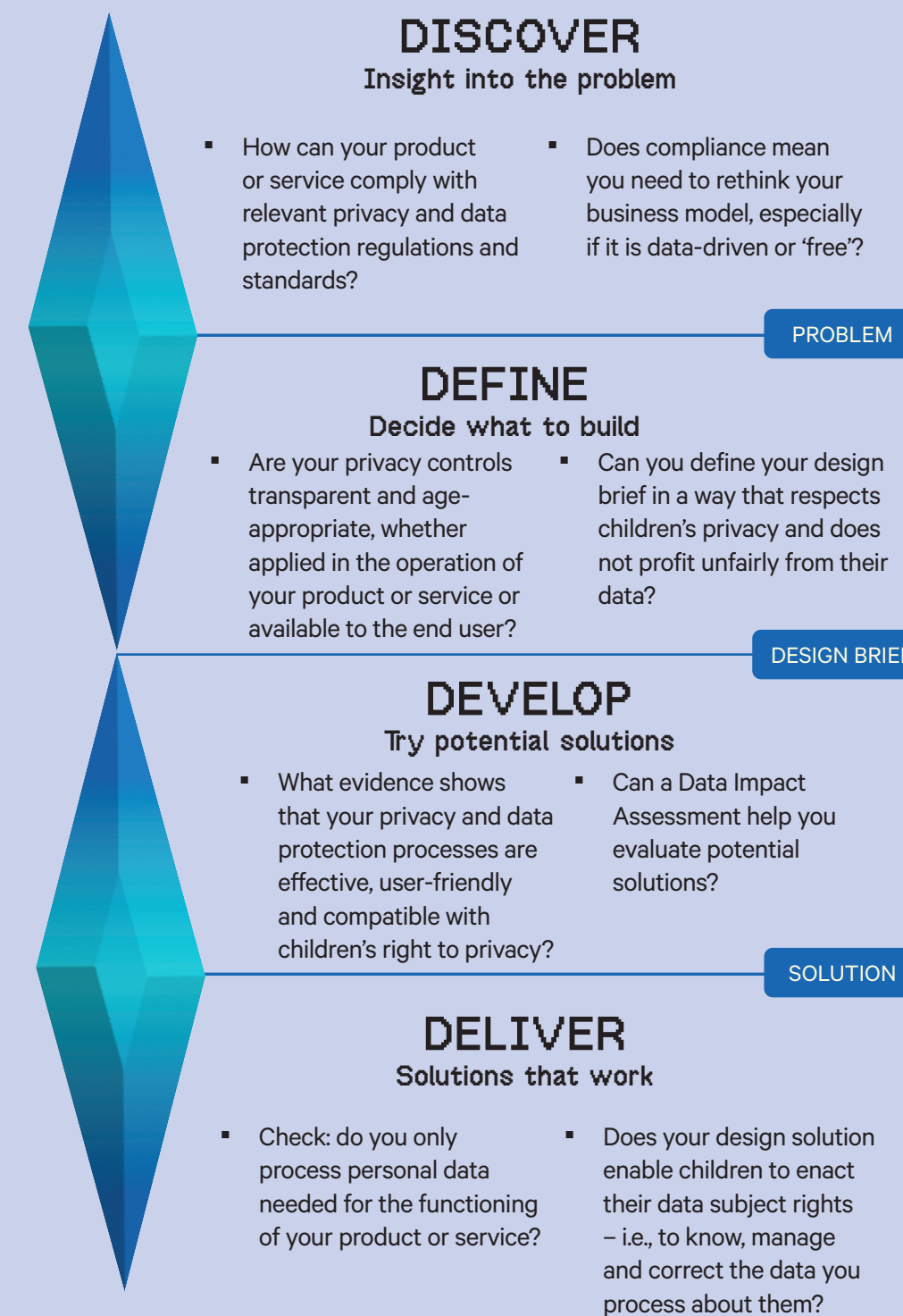
The **ICO's** children code design guidance – 'Design for meaningful parent or guardian–child interactions' – provides tools to design privacy information that meets children's needs as they grow and develop.

THE NORWEGIAN DATA PROTECTION AUTHORITY explains what data protection by design and by default entails in practice and provides guidance on the relevant data protection rules in the EU GDPR.

AMURABI'S HUMAN-CENTRED APPROACH to legal design shows how to make privacy terms and other Terms & Conditions (T&Cs) child-friendly and comprehensible.

How can you make your product or service respect children's privacy?

Here are some questions to ask yourself throughout your design process



PRINCIPLE 8: SAFETY



Embed safety-by-design in product development and use.

Safety in digital innovation requires innovators to take preventive measures proportionate to the risks, remedies, support and care for victims. However, careful consideration is also needed to ensure that the protection of children does not come at the cost of children's full enjoyment of the digital environment and other rights.

The principle of safety draws together three sets of children's rights:¹⁴³

- Protection against abuse and neglect: considering how digital technologies can be abused to facilitate violence and harm against children or to recruit children for extremist, terrorists or other violent activities.
- Special protection against sexual exploitation and sexual abuse: including the use of digital technologies 'to solicit children for sexual purposes and to participate in online child sexual abuse'.
- Promotion of physical and psychological recovery and social reintegration of child victims: within an environment that encourages good 'health, self-respect and dignity of the child'.

In the digital environment, risks of harm to children manifest in various forms, including 'cyberaggression', 'cyberattacks' and 'information warfare'; digital technologies could also be used to facilitate 'child trafficking' and 'gender-based violence'.¹⁴⁴

"Safety, meaning that if you are in danger, you can help yourself."

(Child aged 7–8, Greater London)

"It could be violent games ... somebody mentioned Call of Duty earlier. So, if ... a 10-year-old or something found that on maybe their older brother's or sister's console or whatever and then started playing it, they'd see all of the violence and everything. And they'll be desensitised to it. And then they'd see things like that later on and think, oh, that's not that bad. And they wouldn't really be aware of how dangerous it was."

(Child aged 12–13, Essex)

¹⁴³ UNCRC Articles 19, 34, 39; General Comment No 25, paras 80–3.

¹⁴⁴ General Comment No 25, para 82.

Making digital innovation safe by design for children does not mean boxing children into a safe digital corner. Instead, embedding safety into digital innovation by design means thoroughly assessing the risks of both the intended and unintended use of digital technologies, and building proportionate measures to mitigate these risks and provide appropriate support and redress when harms occur.

"If the app hasn't been fully developed, there could be gaps in its safety system, so there could be piracies, or people could be able to download things on to there that they shouldn't be able to... If you see those things, ... it could be ransomware, so you could have to pay money to be able to get things back. It could just completely take over your computer, and it could get all of your bank account details and everything like that. And then you probably won't feel safe on the internet again for a very long time."

(Child aged 12–13, Essex)

Relevant legal frameworks and guidance

To assess online risks to children and devise proportionate measures, digital innovators need to recognise different categories of risks: content, contact, conduct and contract.¹⁴⁵ The UK Online Safety Bill prescribes 'children's risk assessment duties' to assess and mitigate content, conduct and contact risks to children.¹⁴⁶ For example, mitigating contact risks requires digital innovators to assess the risk of 'functionalities enabling adults to contact other users (including children) by means of the service.'

"TikTok, YouTube, Instagram can be bad because of cyberbullying."

(Child aged 11–12, Yorkshire)

"Instagram has this thing where someone DMs you, messages you, you have the option to say, no, I don't want them to message me, or yes, I do, which I think is good."

(Child aged 13–14, Essex)

¹⁴⁵ Content risks involve engagement with or exposure to harmful content. Contact risks refer to children's exposure to harmful contacts. Conduct risks include witnessing, participating in or being a victim of potentially harmful conduct, such as cyberbullying. Finally, contract risks manifest through exploitative contract terms. See Livingstone & Stoilova (2021).

¹⁴⁶ Part 3, Chapter 2, Providers of user-to-user services: Duties of care in the UK Online Safety Bill (subject to change).

Design cases

While hate, cyberbullying¹⁴⁷ and harmful online content (e.g., ‘pro-ana’¹⁴⁸) are symptoms of social ills, digital innovation can form part of the solution. Design safe spaces for users, including children, while ensuring that abusive behaviour or harmful content does not reach them by taking safety-by-design measures.

Notice-and-take-down and moderation systems are standard measures referred to in legislation¹⁴⁹ and voluntary guidelines.¹⁵⁰

The purpose is to ‘detect, surface, and remove illegal and harmful conduct, contact and content with an aim for preventing harms before they occur’ and ‘feedback loops that inform users on the status of their reports [and outcomes]’.¹⁵¹

However, the administration of moderation systems could interfere with children’s other rights, including freedom of expression and information. To address this, the Santa Clara Principles on Transparency and Accountability in Content Moderation emphasise:¹⁵²

- Human rights and due process
- Understandable rules and policies
- Cultural competence
- State involvement in content moderation
- Integrity and explainability.

Other measures to mitigate online risks are also available. Examples include ‘blocking technologies’, ‘heuristic filtering’, ‘automated CSAM detection’ and ‘web crawlers’.¹⁵³

To build safety into digital innovation by design, digital innovators first need to understand the nature of online risks to children, assess them against the features and functionalities of their products and services, and devise proportionate measures to mitigate them. Innovators also need to support children in ways compatible with their needs and appropriate to the risks.

¹⁴⁷ Anti-Bullying Alliance (2022).

¹⁴⁸ Bhardwaj (2020).

¹⁴⁹ UK Online Safety Bill (subject to change), Australia Online Safety Act (2021) and EU Digital Services Act (2022).

¹⁵⁰ Australian Office of the eSafety Commissioner (2019); DCMS (2019); Broadband Commission (2019).

¹⁵¹ Principles 1.5 and 2.4 of Safety by Design (Australian Office of the eSafety Commissioner, 2019).

¹⁵² Access Now et al (2018).

¹⁵³ Broadband Commission (2019).

¹⁵⁴ 5Rights Foundation (2022).

¹⁵⁵ Australian Office of the eSafety Commissioner (2019).

¹⁵⁶ Designed with Kids in Mind at <https://designedwithkidsinmind.us>

¹⁵⁷ Big Motive (2023).



SUGGESTED DESIGN TOOLS

SRIGHTS Foundation’s Child Online Safety Toolkit is a how-to guide for making digital products and services safe for children based on children’s rights. It also comes with good practice examples.¹⁵⁴

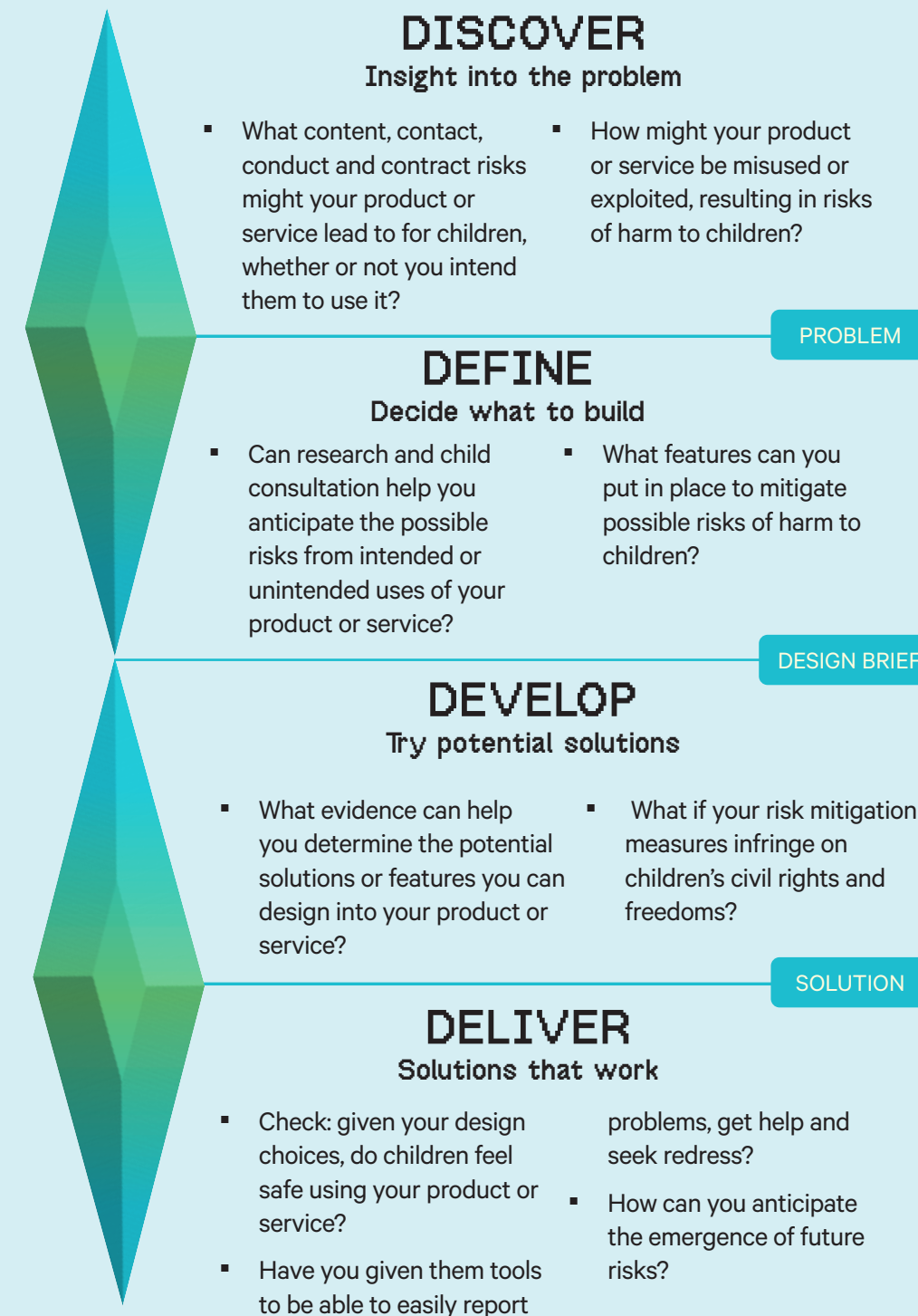
THE AUSTRALIAN ESAFETY COMMISSIONER’s guidance offers an approach to embed users’ safety and rights at the centre of digital design, prioritising risk mitigation and consumer protection over the concept of ‘profit at all costs’.¹⁵⁵

DESIGNED WITH KIDS IN MIND’s resource provides examples of design techniques that harm children and explain the problems such techniques contribute to. This is a collection of examples not to follow.¹⁵⁶

BIG MOTIVE’s Kids First report looks at how the online world can be transformed into a safer place for children and young people.¹⁵⁷

How can you make your product or service safe for children?

Here are some questions to ask yourself throughout your design process



PRINCIPLE 9: WELLBEING



Enhance and do not harm the health and wellbeing of all children, including through the use of inclusive design.

Wellbeing in digital innovation relies on design choices that enhance a child's life satisfaction. These can include, for example, promoting a balanced lifestyle, emotional regulation and supportive social connections. Good design can also make mental and physical health and other forms of support easily accessible.

The principle of wellbeing draws together several children's rights, including:¹⁵⁸

- Life, survival and development
- Recognition of the particular requirements of children with disabilities and their entitlement to special care and assistance
- Enabling children to access 'the highest attainable standard' of health, including services, treatments and rehabilitation
- Adequate standard of living and material assistance to support wellbeing
- Protection from substance abuse and forms of addiction.

Digital innovation that promotes children's wellbeing encompasses diverse products and services, including games, social media and video streaming platforms. For innovation to promote children's wellbeing, it should encourage a healthy and balanced lifestyle rather than feeding compulsion, unhealthy habits or harmful experiences.

"Before lockdown, because I was on my phone so much, I'd have a screentime thing, so my phone would lock at the end, if I had been on it for about, I think it was four hours a day."

(Child aged 12–13, Essex)

"I think YouTube is good because I watch dance tutorials and acting challenges [challenges] because I love those things."

(Child aged 11–12, Yorkshire)

¹⁵⁸ UNCRC Articles 6, 23, 24, 26, 27, 33; General Comment No 25, paras 14, 89–98.

Design cases

Data-driven technologies that automate decisions (e.g., algorithms, AI) can improve children's social care and safeguarding decisions, provided care is taken to mitigate false positive or false negative results and bias in the datasets.¹⁵⁹

For children to reap the full benefits of wellbeing enhanced by digital technologies, innovators need to bake in privacy, safety and security in designing products and services and handling data about children. This means innovators should evaluate their design decisions and account for 'the capabilities of the user population' when anticipating the likely consequences for wellbeing.¹⁶⁰

"I want to never see ... mean things or hacking because if someone gets ... hurt, he wouldn't play the game."

(Child aged 7–8, Greater London)

Security is essential to digital innovation in health and social care. The UK Department of Health and Social Care issued a code of conduct for data-driven health and care technology, recommending innovators to:

Make security integral to the design: keep systems safe by safeguarding data and integrating appropriate levels of security into the design of devices, applications and systems, keeping in mind relevant standards and guidance.¹⁶¹

For other digital products and services likely accessed by children, innovators should avoid design options that undermine children's social relationships, disrupt healthy routines or manipulate their choices to their detriment.¹⁶²

Digital innovation for wellbeing recognises and accommodates special requirements of children with disabilities, promoting diversity, equity and inclusion. For example, children with disabilities describe opportunities for seeking information, communicating, learning, playing and socialising that are not possible in the non-digital world – visual explanations on YouTube, voice programmes on laptops, spell checks, online discussion groups otherwise inaccessible to them, and more.¹⁶³

To enhance children's wellbeing, innovators should promote healthy and balanced lifestyles by providing easy access to health information and health and social services, encouraging active living (e.g., hybrid games that promote physical exercise) and offering creative opportunities (e.g., a sandbox game). Innovators should also refrain from deploying design features that cultivate compulsion (e.g., excessive gamification techniques), are detrimental to children's relations with others, or are disruptive of a healthy routine.

¹⁵⁹ Centre for Data Ethics and Innovation (2020).

¹⁶⁰ Australian Office of the eSafety Commissioner (2019, p 31).

¹⁶¹ Department of Health and Social Care (2018, p 5).

¹⁶² van der Hof et al (2021, p 59).

¹⁶³ Lundy et al (2019); General Comment No 25, paras 90–2.

'Thinking of the apps you use, what's good and bad for wellbeing?' (11- to 12-year olds, Yorkshire)

ADDICTIVE

TIKTOK YOUTUBE INSTAGRAM CAN BE BAD TNG.

YOU CAN MAKE ONLINE FRIENDS AND THEY COULD BE PRETENDING TO BE SOMEBODY ELSE.

I THINK TIKTOK IS BAD BECAUSE YOU CAN SEE SOMETHING THAT CAN MAKE YOU FEEL BAD OR INSECURE.

GOOGLE IS GOOD BECAUSE YOU CAN GET [KNOWLEDGE].

ROBLOX IS GOOD TO PLAY WITH FRIENDS.

TIKTOK BECAUSE YOU SPEND MORE TIME THAN YOU THINK.

SOMETIMES PEOPLE COMMENT ON YOUR VIDS/ PICS WHICH MAKES PEOPLE INSECURE.

TIKTOK CAN BE BAD BECAUSE YOU CAN GET THINGS YOU DON'T LIKE POP UP.

PEOPLE SAY BAD STUFF TO OTHERS AND [THAT'S] BAD FOR [MENTAL] HEALTH.

TIKTOK ISN'T THAT GOOD BECAUSE ANYONE CAN ADD OR SEE YOUR ACCOUNT UNLESS IT'S ON PRIVATE.

THE PHONE APP WHERE YOU CAN PHONE PEOPLE BECAUSE PHONE SOMEBODY IF YOUR IN TROUBLE [YOU ARE IN TROUBLE].

ADVERT!

[YOU ARE] DOING ANYTHING AS A GROUP OR PLAN STUFF.



SUGGESTED DESIGN TOOLS

THE NHS' Digital Technology Assessment Criteria (DTAC) offers a comprehensive framework for assessing clinical safety, data protection, technical security, interoperability, usability and accessibility of digital health technologies.¹⁶⁴

KORA offers a good practice and design guide for a mobile app to support children with walking disabilities. This is informed by children's rights and child-centred design.¹⁶⁵

UNICEF AND WESTERN SYDNEY UNIVERSITY'S Responsible Innovation in Technology for Children (RITEC) offers a newly developed wellbeing framework for making digital technologies good for children's wellbeing, based on children's own understanding of wellbeing.¹⁶⁶

THE BBC'S digital wellbeing work offers insights on developing tools that carefully takes into account how psychological factors, individual needs and values apply at different ages, to inform the design of future services.¹⁶⁷

THE FAIR PLAY ALLIANCE AND JOAN GANZ COONEY CENTER is developing the Design Playbook for Digital Thriving, including concrete approaches to game design, and innovative ways to measure digital thriving.¹⁶⁸

¹⁶⁴ NHS England Transformation Directorate (2022).

¹⁶⁵ Erben (2022).

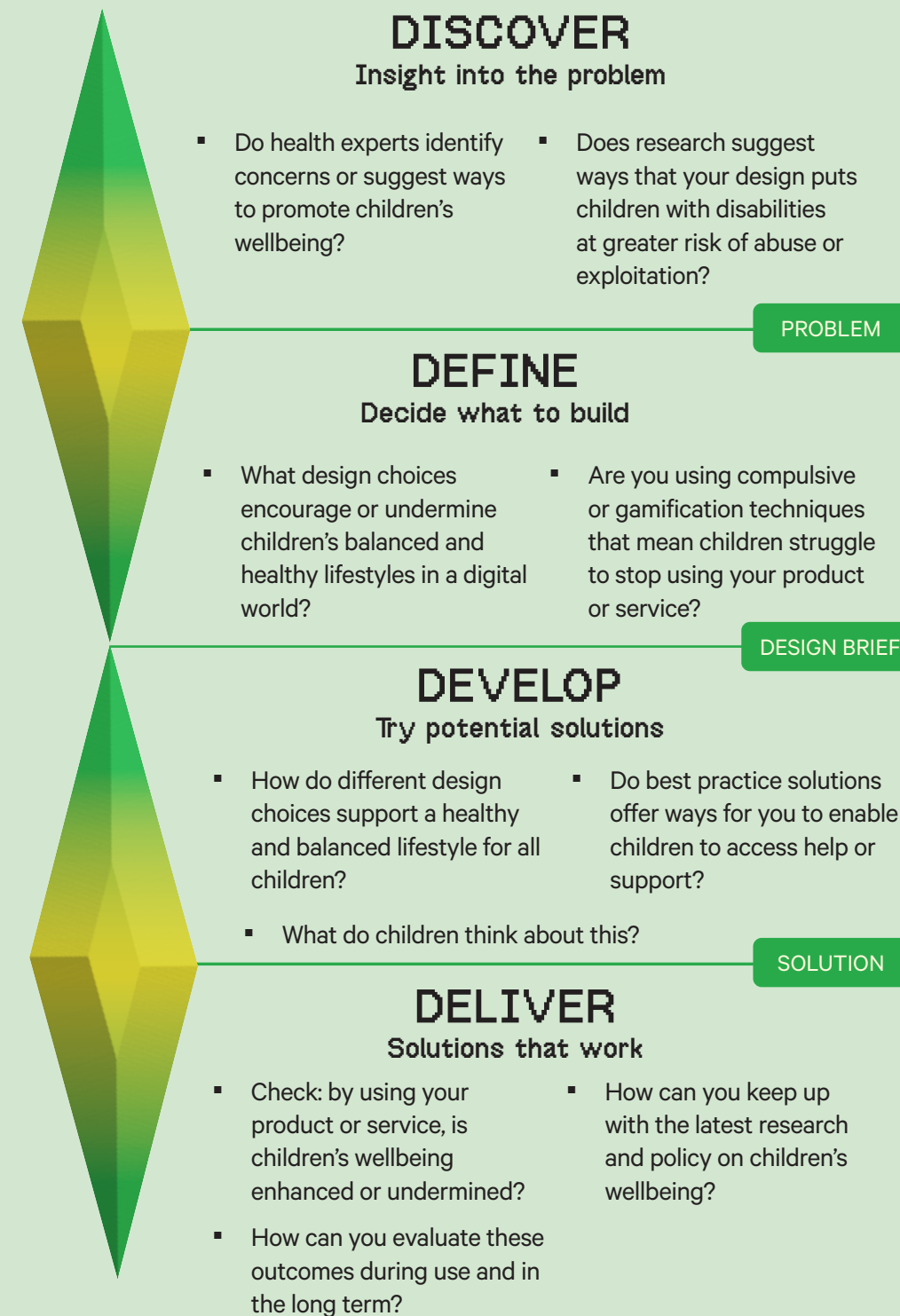
¹⁶⁶ UNICEF & Western Sydney University (2022).

¹⁶⁷ BBC (2019).

¹⁶⁸ Hart, Miller, & Voll, (2023).

How can you ensure that your product or service enhances and does not harm children's wellbeing?

Here are some questions to ask yourself throughout your design process



10 PRINCIPLE 10: DEVELOPMENT



Enable children's learning, free play, sociability and belonging, and their fullest development.

Today's digital environment has wowed children with opportunities for learning and social, cultural, recreational and playful activities.

Development requires resources and designs that offer creative outlets to encourage imagination, educational opportunities of all kinds, resources that recognise and celebrate cultural and linguistic diversity, and an enabling environment for children to thrive in, belong to and pursue the opportunities they choose.

The principle of development draws together three sets of children's rights:¹⁶⁹

- Education: making education (formal, non-formal, informal) accessible and affordable to children of all ages and circumstances to enable learning and, more ambitiously, children's fullest development.
- Culture: enabling children to enjoy their own cultures and others', and allowing children to 'profess or practice' their religion and speak their languages.
- Play, leisure and artistic activities: the right to play, recreational activities and rest.

While adults have the power to provide these opportunities, too often these are insufficient, inappropriate or restricted from children's points of view.¹⁷⁰ Society is often ambivalent about the role of digital technologies in children's development, being unclear which digital activities bring benefits or harms. Innovators have a crucial role to play here, along with civil society and child rights advocates, in building a digital world in which children can fully develop.

"I've been using [Yousician] for a year, and I try to teach myself the electric guitar... It has developed me so much ... it can go at your own pace, and I can do what I want. If I want to learn shredding which is something you play really fast on guitar, I can start learning that straight away."

(Child aged 13–14, Essex)

¹⁶⁹ UNCRC Articles 28–31. General Comment No 25, paras 99–111.

¹⁷⁰ See Mukherjee & Livingstone (2020) for UK children's views of the digital world, and Third & Moody (2021) for an international consultation with children.

Ideally, innovators would:

prioritise creative resources and imaginative, open-ended play over pre-determined pathways built on popularity metrics or driven by advertising or other commercial pressures.¹⁷¹

Digital technologies also facilitate remote learning and connection – this was vital during the COVID-19 lockdown and other emergencies that disrupt in-person education. When it comes to formal education, evidence of pedagogical benefits – especially in the face of the data protection risks children are exposed to when using EdTech – is less than compelling, and better designs are needed.¹⁷² However, digital technologies should not be promoted as substitutes for face-to-face learning: children want and need social interaction within school environments, which is also hugely important for their social and educational development.

Design cases

To ensure that children enjoy the full benefits of the digital environment, innovators need to contribute to education – including media and digital literacies about the nature of the digital environment itself. This can be facilitated through child-friendly terms of service and transparency on how innovators treat children, including how they handle children's data or provide help or redress.¹⁷³ By providing effective support and systems for reporting and managing content, contact, conduct and contract risks, innovators can help children develop key 'digital competencies'.¹⁷⁴

"Can you make more apps based on Toca World? Because it is so creative ... lots of children ... can do something creative instead of watching something."

(Child aged 7–8, Greater London)

¹⁷¹ Livingstone & Pothong (2021a).

¹⁷² Hooper et al (2022); General Comment No 25, para 105.

¹⁷³ General Comment No 25, para 104.

¹⁷⁴ According to the Broadband Commission (2019, p 22), key competencies include 'digital safety', which refers to children's ability to navigate a range of online risks, 'digital security' – children's ability to navigate data protection and cybersecurity risks, and 'digital EQ' – children's ability to read and navigate emotional exchanges online.

¹⁷⁵ Principle 6 of Designing for Children's Rights V.1.31 (D4CR, 2017). See also D4CR (2022, nd-b).

¹⁷⁶ Livingstone & Pothong (2021a, p.8).

¹⁷⁷ Livingstone & Pothong (2021a, p.8).

However, innovating for children's development is not and should not exclusively be about enabling children to navigate online risks and harms. It is equally about 'creating space for play, including a choice [for children] to chill'.¹⁷⁵ Play can benefit from open-ended design, which prioritises 'features that offer easy-to-use pathways, flexibility and variety as these support children's agency and encourage their imaginative, simulating and open-ended play'.¹⁷⁶

Indeed, to support children's development, innovators should:

allow for experimentation, recognis[ing] that exploration, invention and a degree of risk taking is important in children's play and that the burden should not fall on [children] to always be cautious or anxious, or to follow rules set by others.¹⁷⁷

Innovators should also celebrate racial, cultural and linguistic diversity in their digital offering, for example by making available 'skins' that represent different ethnic origins and cultures in Minecraft,¹⁷⁸ and making content available in multiple languages and for those of different abilities. Innovators should think carefully about the impact of the features and operation of their products and services on children's opportunities to play, learn and develop. They should prioritise design options that inspire children's imagination and engage children in age-appropriate ways to promote learning, enjoyment, belonging and development.

Q SUGGESTED DESIGN TOOLS

The **DIGITAL FUTURES COMMISSION'S** 'Playful by Design Tool' offers prompts and pathways for designers to reflect on their design choices and think of other design possibilities in relation to the resulting outcomes of children's playful experiences, based on children's rights.¹⁷⁹

DESIGN 4 CHILD RIGHTS (D4CR) offers a set of design principles aimed at embedding ethics and children's best interests into digital product design and development.¹⁸⁰

THE LEGO FOUNDATION'S Children, Technology and Play report provides research-based insights into how children acquire knowledge and skills through play, and recommendations for digital innovators, parents, teachers and policymakers on how technologies can be built and harnessed to support children's learning through play.¹⁸¹

THE HASSO PLATTNER INSTITUTE OF DESIGN'S resource, Design for Belonging, offers designers practical resources and a slide deck to create spaces and processes that foster belonging.¹⁸²

JISC offers a range of resources for learning design in digital spaces, mapped to the Double Diamond of design innovation. Although designed for young adults, there is much here that's helpful for children.¹⁸³

¹⁷⁸ General Comment No 25, para 104.

¹⁷⁹ DFC (2022).

¹⁸⁰ D4CR (2022).

¹⁸¹ The LEGO Foundation (2020).

¹⁸² Hasso Plattner Institute of Design (2022).

¹⁸³ Jisc (2018).

How can you help promote children's development with your product or service?

Here are some questions to ask yourself throughout your design process

DISCOVER

Insight into the problem

- Children love to learn, play and enjoy digital cultures – how can your product or service support this?
- Can research or consultation with children guide you in supporting children's cognitive, social, emotional and physical development?

PROBLEM

DEFINE

Decide what to build

- What design choices would encourage curiosity and exploration, free (or child-led) play or sociability and a sense of cultural belonging?
- What can you do to make your product or service a meaningful experience for children to develop fully?

DESIGN BRIEF

DEVELOP

Try potential solutions

- Are your design features helping children learn new things, develop new skills or enjoy playful activities and social interactions at their own pace and on their own terms?
- Why might children feel bored or frustrated or that your product or service is not good for them?

SOLUTION

DELIVER

Solutions that work

- Check: can you evaluate whether your solution fuels children's fun and imagination, encourages their exploration and experimentation, and supports culturally meaningful social interaction?
- What more would children hope for from your product or service?

PRINCIPLE 11: AGENCY

Support child users' decision-making and reduce exploitative features and business models that harm their agency.

Having agency means children can decide freely how to engage with the digital environment. This includes being able to start and stop using digital products and services of their choice easily, without feeling they are losing out, knowing and getting precisely what they have signed up for, and not being tempted, manipulated or nudged into doing anything that undermines their safety, privacy, development and wellbeing.

The principle of agency draws together two sets of children's rights:¹⁸⁴

- Protection against economic exploitation: the right not to be subjected to unfair exchange.
- Protection against other forms of exploitation: the right not to be subjected to treatment that undermines children's welfare.

Economic (or commercial) exploitation in the digital environment extends beyond the traditional notion of economic exploitation centred on child labour and manifests in various forms.¹⁸⁵ It includes persuasive design to maximise children's attention and monetisation of personal data as well as dark patterns and other features crafted to manipulate users' choices.¹⁸⁶ It also includes processing data for commercial purposes such as advertising without considering children's vulnerabilities or benefiting children or their data unfairly.

"I usually search on [Google], and I often trust [Google] a lot... Please make less [adverts]."

(Child aged 9–10, Greater London)

"One bad thing is that you will end up going on it every day [and] you won't go out, you would stay at home."

(Child aged 13–14, Yorkshire)

Protection against such exploitation does not mean businesses cannot profit from their product or service offerings. But it does mean designing for the fair treatment of child users and fair processing of their data so that children are not treated unjustly, and nor are their vulnerabilities taken advantage of. Unfair or unjust treatment doesn't mean actual detriment or harm has occurred. For example, a loss of opportunity (for the child) or imbalance of benefits gained (children vs. companies) can be



¹⁸⁴ UNCRC Articles 32, 36; General Comment No 25, paras 40–2, 112–13.

¹⁸⁵ Lievens et al (2019); Atabey et al (2023).

¹⁸⁶ Dark patterns are user interfaces designed to nudge or manipulate users' choices. See Gray et al (2018); Mathur et al (2019); Narayanan et al (2020). For other potentially exploitative design features, see UNICEF (2019, pp 23–4); Williamson (2019); Zuboff (2019); Barassi (2020); Radesky et al (2020a, b); Bengtsson et al (2021); Dinsmore & Pugh (2021); Dodd et al (2021); Mascheroni & Siibak (2021); Competition and Markets Authority (2022).

'unfair', making a practice exploitative.¹⁸⁷

"It [should be] made in a way that it is for me, as well as being they want loads of money."

(Child aged 12–13, Essex)

Relevant legal frameworks and guidance

Commercial exploitation is generally prohibited under consumer protection, advertising and gaming laws and frameworks. Specifically, contexts of use, interfaces, design and structures that disguise the intention of service providers to promote additional or other products or services, including encouragement of in-game or in-app purchases and any 'direct exhortations to children to buy', are likely in breach of the UK Consumer Protection from Unfair Trading Regulations (CPUTR) 2008.¹⁸⁸

Significantly, relevant legal frameworks and guidance can differ by sector. For example, advertising to children is regulated by a mix of laws and self-regulatory codes in the UK (Code of Non-broadcast Advertising and Direct & Promotional Marketing [Committee of Advertising Practice (CAP) Code]¹⁸⁹ supplements the relevant laws [e.g., the CPUTR 2008]).

Sector-specific codes also matter when showing compliance with the UK GDPR and the AADC.¹⁹⁰ For example, the ICO advises considering sector-specific guidance and refers to the CAP Code when assessing whether data processing for advertising can harm children.¹⁹¹ Design features intended to prolong children's engagement and the use of data processed from children to profile them for targeted marketing are in direct breach of Standard 5 (Detrimental use of data) of the AADC.¹⁹² Also relevant is the Office of Fair Trading's 'Principles for online and app-based games'.¹⁹³

Design cases

Not all persuasive or behavioural designs to improve user engagement or monetisation of personal or interaction data, for example for profiling, are problematic.¹⁹⁴ Such design techniques and data uses become exploitative and encroach on children's agency and rights when commercial interests are prioritised over a child's best interests. This applies, for instance, when the product undermines a child's choice to leave a situation freely or pushes them to make choices that are not good for them.

Our co-design workshops with designers from both large and small companies surfaced designers' common challenge – the 'balancing act' between engaging interactions and users' 'autonomy'. Some referencing lines exist to determine what design practices constitute exploitation or unfair treatment. For example, Article 25 of the EU Digital Services Act (DSA) bans aspects of dark patterns – the design interfaces that manipulate users' choices or decisions.

¹⁸⁷ Atabey et al (2023).

¹⁸⁸ See the Annexe to the Office of Fair Trading's 'Principles for online and app-based games: Relevant legislative provisions' (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/288361/oft1519a.pdf) and the UK CPUTR 2008. With the UK Consumer Rights Act 2015, CPUTR prohibits unfair, including misleading, commercial practices and aggressive sales tactics.

¹⁸⁹ The CAP Code applies to business-to-consumer marketing communications in non-broadcast media. For advertisements in broadcast media, the Advertising Standards Authority's (ASA) Code of Broadcast Advertising (BCAP Code) applies. See Broadcast Committee of Advertising Practice (2021); ASA (2022); Conway (2022a).

¹⁹⁰ ICO (2020, p 44).

¹⁹¹ ICO (2022b, p 27) notes, 'It is good practice to consider sector specific guidance on marketing, such as from the Advertising Standards Authority, to make sure that you do not use children's personal data in a way that might lead to their exploitation.'

¹⁹² ICO (2020).

¹⁹³ Office of Fair Trading (2015) at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/288360/oft1519.pdf.

¹⁹⁴ van der Hof et al (2020).

Other guidance also exists to inform innovators about exploitative practices:

Reduce compulsive features designed to prolong user engagement or cultivate dependency on games, apps or platforms, so children's immersive play is intrinsically motivated and freely chosen.¹⁹⁵

Principle 7 (Prevent the profiling of children) and Principle 8 (Avoid the economic exploitation of children at all times) of the Dutch Code for Children's Rights (Code voor kinderechten) advise against profiling and design features intended to cultivate children's dependence on an app or a game, respectively.¹⁹⁶

"You have the right not to be exploited... Terms and conditions ... should be easier to understand ... because you've got, like, 10 pages through them. Just skip it. But there might be something in there that's not good. They should just make it a really short sentence that is quickly run through ... because people have a lot shorter attention span."

(Child aged 12–13, Essex)

By building agency into digital products and services, innovators should avoid manipulating children's decisions. Instead, they should prioritise design features that put children in charge of their digital experiences, and be upfront about their commercial intents.

¹⁹⁵ Principle 4 of Playful by Design (Livingstone & Pothong, 2021a).

¹⁹⁶ van der Hof et al (2021).

¹⁹⁷ ICO (2020).

¹⁹⁸ Office of Fair Trading (2015).

¹⁹⁹ BBC (2022).

²⁰⁰ 5Rights Foundation (2021a).



SUGGESTED DESIGN TOOLS

THE EUROPEAN DATA PROTECTION BOARD

(EDPB) guide offers ways to recognise and avoid common dark pattern techniques, such as 'overloading', 'stirring', 'hindering' and 'fickle', common in social media and relevant GDPR provisions for dark pattern assessments.¹⁹⁷

The WORLD ECONOMIC FORUM's toolkit

offers a checklist for innovators and specific guidelines for product teams on how to make AI fair, inclusive, responsible, safe and transparent for children.¹⁹⁸

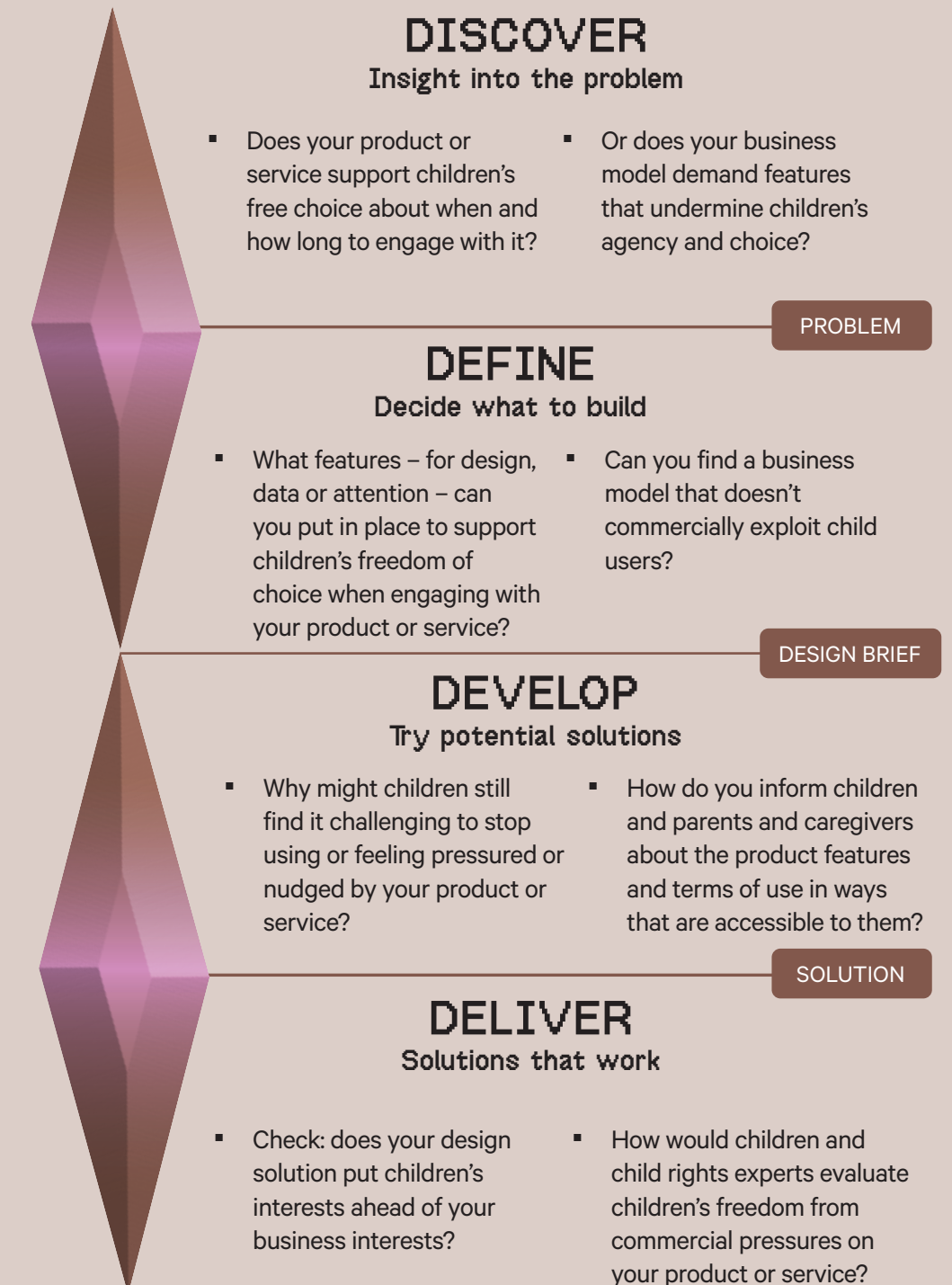
The BBC's 'Human values' toolkit provides a collaborative design framework to help innovators develop on-demand, interactive and connected products and services in ways that are humane and nourishing rather than extractive for people, including children.¹⁹⁹

5RIGHTS FOUNDATION

Tick to Agree explains how legal terms can be made age-appropriate and child-friendly.²⁰⁰

How can your product or service support children's decision making and agency?

Here are some questions to ask yourself throughout your design process



'Please write to the boss of one of the apps you use and tell them the changes you'd like'

Dear TikTok,

I am writing to you about my opinions, requests and positives about your App. I believe that age restrictions should become harder to bypass as I see many young children below the age of 12. This could cause issues as there are several things on the App barely appropriate for the minimum age let alone younger group. You also should look into higher censorship as there has been many events in the past of extremely gruesome clips: a guy shooting himself, a guy getting hit + [decapitated] by a bus and children playing with guns.

From Girl, Year 8, Essex

Dear Cookies

I am writing to you to tell you about how you are looking at other people's information online. I would like you to change the fact that you are looking at other peoples searches. They just accept your terms and conditions because they can't be bothered to read them as they are so long. Please change this.

From Girl, Year 8, Essex

Dear Toca World

Can you make more apps based on Toca World? Because it is so [creative] for lots of children so they can do something [creative] instead of watching something.

From Girls, Year 3, Greater London

Dear Netflix

I would like you to change the age restrictions policy. For example, four year olds could accidentally watch something that there are not supposed to. Additionally, it should not be just the parents that judge what should be watched.

From Boy, Year 8, Essex

Dear Boss of YouTube

When did you start your [company]? You can upgrade the search History by [a speaker and it speaks] the name or thing that you said. Also, you should show the news and NO ADDS [ADVERTS]

From Girl, Year 3, Greater London

Dear FIFA companies,

Can you do more tournaments and cups? Can you do a six+ for to do not let people in this game who is going to swear. Please change the background to Messi and [Neymar] and Ronaldo because I get bored of seeing normal FIFA.

From Boy, Year 3, Greater London

To YouTube

Can you make age sections and a message to tell us this is inappropriate for children and when people are searching can you make us type it and gave that's all.

From Girl, Year 3, Greater London

CHILD RIGHTS BY DESIGN: 11-POINT CHECKLIST

Here's an 11-point checklist for innovators to implement Child Rights by Design.

<p>Ask yourself, how do the 11 principles apply to your digital product or service?</p>	<p>Identify which steps you need to take to ensure your digital product or service respects children's rights.</p>
<p>✓ ✗</p>	
<p>Principle 1: Equity and diversity Do you treat all children equally, fairly and support vulnerable children?</p>	<p>Take steps to be inclusive, treat everyone fairly and provide for diverse needs and circumstances.</p>
<p>Principle 2: Best interests Are children's best interests a primary consideration in product design?</p>	<p>Take steps to embed children's best interests in product development and design.</p>
<p>Principle 3: Consultation Are children meaningfully consulted in developing your product?</p>	<p>Take steps to engage and listen to the views of children in product development and design.</p>
<p>Principle 4: Age appropriate Is your product appropriate for child users or adaptable for children of different ages?</p>	<p>Take steps to develop products that are age appropriate by design and consider using age assurance.</p>
<p>Principle 5: Responsible Do you review and comply with laws and policies relevant to child rights?</p>	<p>Take steps to comply with legal frameworks, provide remedy as needed, and conduct a Child Rights Impact Assessment.</p>

<p>✓ ✗</p>	
<p>Principle 6: Participation Does your product enable children to participate in digital public spaces?</p>	<p>Take steps to enable children's expression, civic engagement and access to information.</p>
<p>Principle 7: Privacy Have you adopted privacy-by-design in product development and use?</p>	<p>Take steps to embed privacy-by-design and data protection in product development and use.</p>
<p>Principle 8: Safety Have you adopted safety-by-design in product development and use?</p>	<p>Take steps to embed safety-by-design in product development and use.</p>
<p>Principle 9: Wellbeing Does your product enhance not harm children's mental or physical health and wellbeing?</p>	<p>Take steps to enhance and not harm the health and wellbeing of all children, including through use of inclusive design.</p>
<p>Principle 10: Development Does your product enable children's learning, imagination, play and belonging?</p>	<p>Take steps to enable children's learning, free play, sociability and belonging, and their fullest development.</p>
<p>Principle 11: Agency Have you taken steps to reduce compulsive and exploitative product features?</p>	<p>Take steps to support child users' decision-making and reduce exploitative features and business models that harm their agency.</p>
<p>Your positive steps will help your product respect children's rights!</p>	<p>This guidance identifies the steps to take for your product to respect children's rights.</p>

CHILD RIGHTS RESOURCES
FOR INNOVATORS

To complement the resources specific to each principle, here are some relevant to most or all Child Rights by Design principles.²⁰¹ Some may be more useful for designers and developers, others for CEOs or policy or legal teams. All are worth a read!



²⁰¹ See Council of Europe (2020); IEEE (2021); Livingstone & Pothong (2021a); OECD (2021); 5Rights Foundation (2022); UN Committee on the Rights of the Child (2021); van der Hof et al (2021); D4-CR (2022); UNICEF (2022).

REALISING CHILDREN'S
RIGHTS IN A DIGITAL
WORLD

"The business sector, including not-for-profit organisations, affects children's rights directly and indirectly in the provision of services and products relating to the digital environment. Businesses should respect children's rights and prevent and remedy abuse of their rights in relation to the digital environment. States parties have the obligation to ensure that businesses meet those responsibilities."²⁰²

This guidance has built on existing laws, standards, regulations and practices. It has also sought to inspire innovators – designers and developers especially – to go beyond these and to transform the digital environment in the process.

We mapped our guidance to the Double Diamond model. This can be applied to many different digital products and services (apps, artefacts, features, processes, devices, digital services or policies), whether they are in development, being updated or revised, or in prospect for future development. However, innovators can't do this alone – they work with many others, notably in legal, research, policy and marketing departments.

"There are lots of quite easy, addictive things that you can put into games to keep kids playing them. I'd almost say that if you're managing to deliver a fun experience and you're not using any of those things, then you probably spent quite a bit of money thinking about that."

(Small digital media and game developer)

"Spotify discovery feed is a way for me to learn more about things that I would not have found out. And that's a very strong piece of personalisation."

(Dating app start-up)

²⁰² General Comment No 25, para 35 (UN Committee on the Rights of the Child, 2021).

Our interviews with digital innovators show that having experience with mainstream digital products and services may not help them design with children's best interests and rights in mind. Moreover, even when innovators are keen to develop a product or service for children, they struggle.

"When they then looked at building digital games ... targeted at children ... it failed miserably because children don't like to be targeted in that way ... they like to be treated as people and feel like they're part of the grown-up world"

(Dating app start-up)

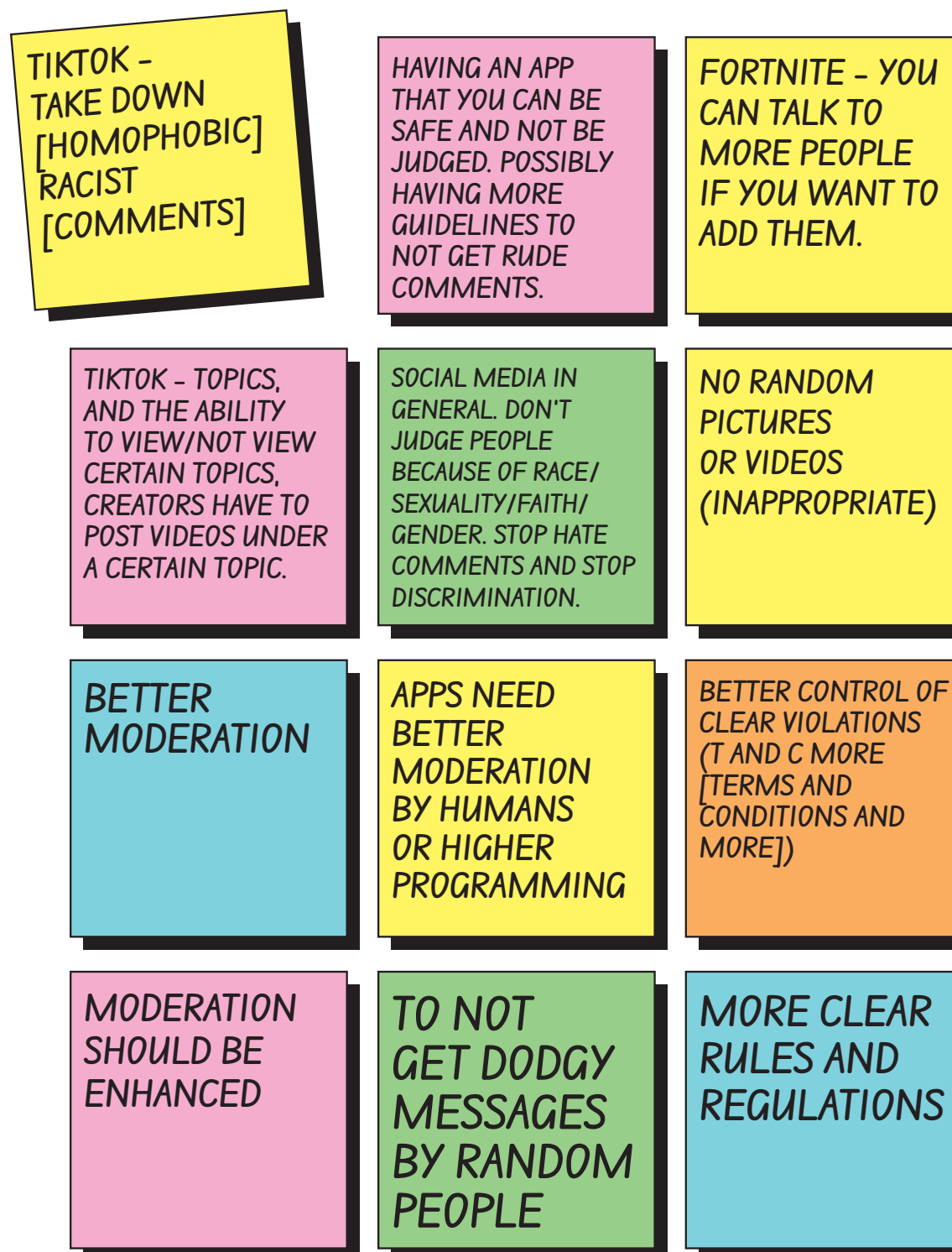
Designers may need to draw on evidence to justify their design options to convince their product managers or funders. Innovators also require some incentive from policymakers or a way to distinguish their child rights-respecting products or services from others. Likewise, policymakers need innovators' insights and commitment to challenge mainstream practices that neglect children's rights, and to show that better paths are possible.

The present mix of legislation, regulation, policy and practice is a moving target. There are calls on all sides for change to embed human rights, ethics and justice into business practices, technological infrastructure and innovation. Such calls are driven by the most egregious problems. To avoid these and build the digital world children deserve, innovators should keep ahead of the curve. The effort will be national and international since the digital has no borders. Given the many regulatory, technological and market uncertainties and the pace of technological innovation, we believe it will serve innovators well to implement rights-respecting principles now.

In the future, better laws may be needed – and policymakers should already be considering these. These could build on the growing understanding of the benefits of technology to children and stimulate child-centred innovation through legal and financial instruments.

Practical resources for designers are also needed. Ideally, these will be informed by professional expertise, children's experiences and emerging good practices. Child Rights by Design should be included in professional training programmes – in business schools, computing, engineering and design schools. It should also be encouraged by the government, promoted by regulators, valued by investors, called for by civil society and recognised by the public. We know children will welcome it.

'What I want to change about the internet'
(12- to 13-year olds, Essex)



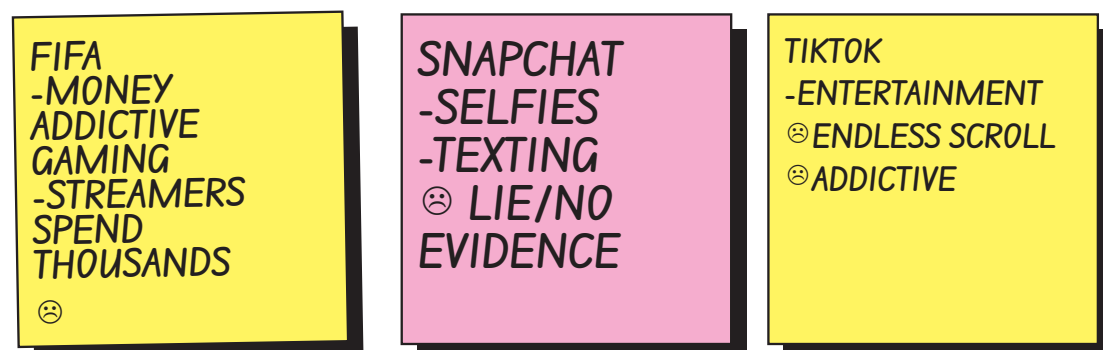
"Thinking of the apps you use, what's good or bad for development, and what features should be included (or not included) in design?"

(13- to 14-year olds, Essex)

Good for development



Bad for development



ANNEX: HOW WE DEVELOPED THIS GUIDANCE

We developed this guidance iteratively over three years.

We followed four main steps:

1. We consulted 19 experts from companies of various sizes, from start-ups to multi-nationals, covering digital media, toys, education, games and social media, to learn about their resources and processes for embedding rights and values²⁰³ into their development of digital products and services.

We then reviewed the compliance claims of 52 digital products and services across various domains to identify the standards and regulations that digital providers use. We found that when designers were asked how they design for child users, they thought about safety, but were unsure which other rights to consider.²⁰⁴
2. We built on our work on Playful by Design – a vision and set of tools for designing for children's right to play in digital contexts. This centred on public consultation and a 'what works' analysis linking the qualities of free play to the design features that enable or hinder them. In addition, we built on ideas of privacy-by-design and safety-by-design, recognising that privacy and safety are 'hygiene factors' – vital to avoid the pitfalls of risky-by-design, but not sufficient for beneficial outcomes overall.²⁰⁵
3. We identified around 100 promising policy documents, laws, regulations, guidelines, industry standards and codes of practice designed to make digital products and services safe, reliable, trustworthy and respectful of human rights. As shown in the Venn diagram, they addressed rights, ethics and wellbeing (group 1), digital technologies (group 2), children (group 3), and combinations thereof.

To inform Child Rights by Design, we prioritised 10 key documents on children's rights in a digital world (group 4) and human rights and technology (group 5). We coded these by the articles of the UNCRC to ensure our guidance is holistic, comprehensive and aligned with international standards in human rights, especially children's. We further coded the documents by the specifications of General Comment No 25 to include relevant insights and recommendations:

- Australian Office of the eSafety Commissioner: Safety by Design (2019)
- Broadband Commission: Child Online Safety (2019)
- Dutch Code for Children's Rights (Code voor kinderechten) (van der Hof et al, 2021)

²⁰³ Livingstone & Pothong (2021b).

²⁰⁴ Livingstone & Pothong (2023).

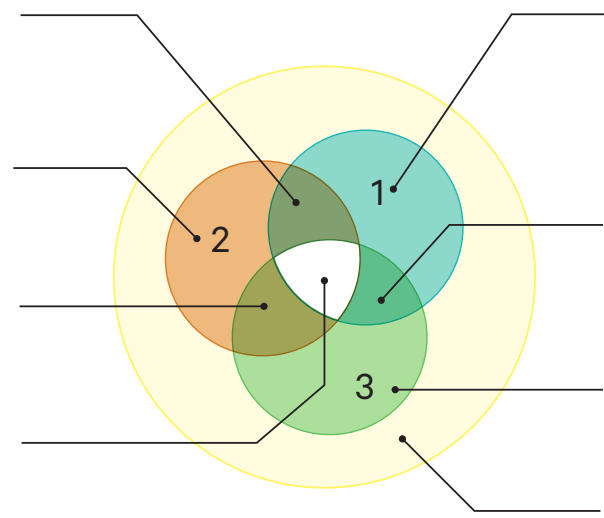
²⁰⁵ Norwegian Consumer Council (Forbrukerradet, 2018); 5Rights Foundation (2021c); Livingstone et al (2022).

5. Examines rights, ethics, etc. In relation digital tech

2. DIGITAL TECHNOLOGIES

7. Children + digital tech: Innovation, marketing, etc.

4. Guidance for innovators to embed children's rights and best interests in a digital world



1. RIGHTS, ETHICS, WELLBEING, ACCESSIBILITY, INCLUSION

6. Examines rights, ethics, etc. In relation to children

3. CHILDREN

8. Universe of interesting research, policy and practice

- Council of Europe: IT Handbook for Policymakers on the Rights of the Child in the Digital Environment (2020)
- DCMS: Secure by Design (2021)
- Designing for Child Rights (D4CR 2.0) (2022)
- Digital Futures Commission: Playful by Design (2021)
- IEEE 'Standard for an Age Appropriate Digital Services Framework based on the 5Rights Principles for Children' (2021)
- Internet Governance Forum: 'Internet Rights & Principles Coalition: Charter of human rights and principles for the internet' (2019)
- OECD: Recommendation of the Council on Children in the Digital Environment (2021b)

4. We held 20 workshops with 143 children aged 8–14 in four schools in different cities around the UK. In this way, we consulted girls and boys from diverse cultural and ethnic backgrounds about their rights, whether they are respected online and what needs to change, building on our earlier review of children's consultations relating to the digital environment.²⁰⁶ Children offered valuable insights into how the digital world can and should be better designed to support their best interests. They were concerned that innovators do not listen to them sufficiently or consider their needs.

These four steps enabled us to synthesise 11 principles for Child Rights by Design. To organise the principles, we drew on the grouping of children's rights used by the UN Committee on the Rights of the Child for its reporting requirements for states parties (CRC/C/58/Rev.3). As shown in the table, we modified this grouping

²⁰⁶ See Mukherjee & Livingstone (2020) and Pothong & Livingstone (2022) for how children call for their agency and an end to restrictions or violations of their rights in digital contexts.

slightly in the light of General Comment No 25, giving individual attention to the general principles of best interests and the right to be heard and to two rights of particular relevance to digital providers – the right to privacy and protection from commercial exploitation. We combined the rights to non-discrimination, family and protection for children in vulnerable or disadvantaged situations under 'equity and diversity'.

Child Rights by Design principles	UN Convention on the Rights of the Child articles	General Comment No 25 paragraphs
Equity and diversity	2, 9–11, 18, 20–3, 25, 27, 30, 35, 37–38, 40	9–11, 87, 114–22
Best interests	3(1)	12, 13, 88
Consultation	12	16–18
Age appropriate	5, 18	15, 19–21, 84–6
Responsible	4, 42	22–7, 33, 35–9, 43–9, 123–4
Participation	7, 8, 13–15, 17	50–66, 79
Privacy	16	67–78
Safety	19, 34, 39	80–3
Wellbeing	6, 23, 24, 26, 27, 33	14, 89–98
Development	28–31	99–111
Agency	32, 36	40–2, 112–13

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