1 | Exploring ideas about robots: Children and educators as co-researchers

EDUCATOR WONDERING

What do children already know about robots and how they work?

THIS LED TO

Educators asking children to share their working ideas about robots.

"Some have wheels."

"The robot goes down into the volcano. It's not safe for people."

"They can sweep up and make dinner."

"A robot is a machine."

"You have a remote control and make them move."

"Robots help us."

"You need to make a plan first, before you build one."

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Educators providing children with tools and loose parts to explore and explain their ideas further.

"Maybe we can build our own robot."

"There is a motor inside."

"If you tell it to do something, it will."

"There's wires. They're for making it work."

THIS LED TO

Educators picking up on a common theme in children's ideas and wonderings:

"If you tell it to do something, it will."

Government of South Australia
Department for Education

"If you tell it to do something, it will."

2 | From robots to robotics: Children as computational thinkers

EDUCATOR WONDERING

Is Cubetto an appropriate robotic tool for children to develop computational thinking and an understanding of coding?

THIS LED TO

Educators providing children with time to collaborate, develop ideas and problem solve with Cubetto.

"The arrows on the row mean point it this way."

"It moves when you put the tiles on... different colours."

"Turn on the switches, press the button, it moves."

"Cubetto is about making patterns."

"When you take a tile out, the light goes off."

"Does clapping make Cubetto move? Maybe it will move if we sing to it."

"Look there's a map, it tells you stuff.".

"The green one makes it go forward, the blue one is a surprise."

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Children discovering Cubetto collaboratively, through play.

Children sharing their wonderings and working ideas about how to talk to Cubetto and discovering ... code.

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Educators observing children experimenting with code and naming code as a series of steps.

"Oh, I can control it."

"The code makes it go. A code is when you put things in and it does it, like a password."

"A code makes robots work."

THIS LED TO

Educators relaunching one child's idea:

"A code makes robots work."

"A code makes robots work."

3 | Children as coders: Exploring coding through play

EDUCATOR WONDERING

What is children's understanding of code?

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Educators exploring and identifying children's technological thinking and coding in unplugged contexts.

"Around the barn."

"We have to listen to instructions."

"Go forward two."

"Go forward ... one, two, three spaces."

"I'm making a code for Rosie."

"Code is arrows. They show you the way."

"Fixing the code will make it work."

"You have to work out which way to go."

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Educators providing children with different environments and materials for them to experiment with code.

Supporting children to read another person's code.

Educators providing opportunities for children to make, read and debug (fix) a code.

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Educators relaunching one child's idea:

"Fixing the code will make it work."

4 | Children as creative thinkers: What else can Cubetto do?

EDUCATOR WONDERING

Could children use their ideas about Cubetto in new contexts?

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Educators supporting children to explore their ideas about Cubetto in open-ended contexts using new materials.

"A code can be different things."

"It is sort of a Cube Artist."

"Cubetto makes a dot when it stops."

"Green, yellow, green, yellow. Maybe it will draw a square."

"Cubetto can kinda make a love heart shape."

"It's drawing the titanic ship."

"You can make beautiful pictures if you know how which colours go to which sides."

"It's like a road with a roundabout."

"Different things can be artists, maybe robots too."

"You can put pens on Cubetto and press the button."

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Educators supporting children to engage in design thinking processes.

Educators asking children open-ended questions relating to their code.

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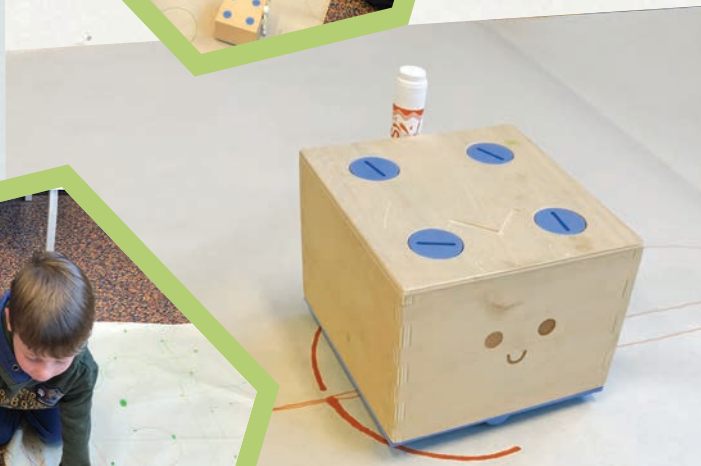
Children's research supporting them to understand and apply coding to new contexts.



"Different things can be artists, maybe robots too."