Educational Toys: Introducing Computational Thinking / Coding links with the Primary Language Curriculum

Computational thinking skills include critical thinking, problem solving and communication. However, embedding Computational thinking to develop key skills to support young people to become engaged thinkers, active learners' non-routine problem solvers, skilled communicators and knowledge constructors may not always be an appropriate or realistic target. One could perhaps identify: turn taking, waiting, anticipation, sequencing, concentration, engagement, completing tasks (partially or) fully, team work to name but a few. Active Pupil Learning is Central as the incorporation of Computational Thinking seeks to promote teachers moving away from teacher centred learning strategies to more constructivist approaches. This needs to be considered in all school situations.

Links with Curriculum

The possibilities and opportunities for linking Oral Language (Primary language Curriculum) with Computational Thinking / Coding with are worth considering.

	Oral Language
Communicating	Engagement, listening & attention
	Motivation & choice
	Social conventions & awareness of others
Understanding	Sentence structure & grammar
	Vocabulary
	Demonstration of understanding
Exploring & Using	Requests, questions & interactions
	Categorisation
	Retelling & elaboration
	Playful & creative use of language
	Information giving, explanation & justification
	Description, prediction & reflection

Resources some teachers are using:

TEACH YOUR KIDS CODE
CODE. BUILD. CREATE.

This website has some fantastic ideas for introducing unplugged/ offline coding activities. These basics of coding without a computer gets you to think about what coding and computational thinking could look like in your classroom. Some of examples include:

- Egg carton unplugged coding activity!
  https://teachyourkidscode.com/egg-carton-unplugged-coding-activity/
- Learn to Code Unplugged with Hotwheels
  https://teachyourkidscode.com/learn-to-code-unplugged-with-hotwheels/
- Don't Step on the Lego! Blindfolded Coding Game for Kids
  https://teachyourkidscode.com/coding-game-for-kids/
- Super Silly Screen Free Coding Activity with Chalk
  https://teachyourkidscode.com/screen-free-coding-activity/
- Teach your kids to code with a deck of cards!
  https://teachyourkidscode.com/coding-unplugged-with-a-deck-of-cards/

Sphero SPRK+ and the Sphero Mini

The Sphero PRK+ and its smaller version the Sphero Mini robot ball packs a ton of fun into programming. Equipped with a gyroscope, accelerometer, and colourful LED lights, this educational robot is more than a mini robot toy. Sphero Mini lets you drive, play games, and code using our free apps. The Sphero Mini possibly has all the features a primary school teacher may need. Some of which include face-drive: drive with your expressions! It comes with two apps Sphero Play and Sphero Edu. Again the Play app may have enough content for many teachers. It is available at Available at apple.com, amazon and argos.ie

Check it out in practice here: https://www.youtube.com/watch?v=0yQYr7CIxBc

Code-a-pillar/ Code-a-pillar Twist

The Think & Learn Code-a-Pillar from Fisher-Priceis a caterpillar that encourages kids to experiment and play while developing coding, sequencing and critical thinking skills — all before they reach school age. The Code-A-Pillar comes with a motorized head and 8 easy to connect segments. Kids connect the segments to make Code-a-pillar go forward, left, right or wherever they choose. Each segment lights up as the action happens with fun character sounds and blinking eyes to bring Code-a-pillar to life!

Initially pupils play with Code-a-pillar and once they can 'program' a path for Code-a-pillar, the sky's the limit. It opens the door to problem solving as they figure out how to get Code-a-pillar to go wherever they want.

Check it out in practice here: https://www.youtube.com/watch?v=3d4zXauy6EM

And here: https://preschoolsteam.com/coding-games-for-kids/

STEAM Park by LEGO® Education

This 295 part Lego STEAM set is designed to allow kids to construct a STEAM Park full of dynamic moving rides, fun games, and scenes using the special selection of LEGO® DUPLO® bricks. Children can grow their understanding of gears, motion, measurement, and solving problems together in a fun and engaging way.

Check it out in practice here: https://www.youtube.com/watch?v=FR6nfFj17_g

Beebots

Nichola Spokes describes how Beebots are used with Junior Infants in Lucan Community National School. The aim of these lessons is to support pupils' problem-solving, development of instructional language, sequencing, organisational skills, and collaboration skills. The Junior Infant class work on a variety of stations over a six week period. The stations include small world, treasure maps, learning directions, phonics, 2D shapes, construction and Beebot app on tablets.
(PDST)HopScotch coding: https://vimeo.com/216470159

Other Ideas:

- For PE class, games with Directional/Action Cards/etc, created by students themselves in stations, directional language, maps, order…
- Scratch Junior
- Code.org
- Code with Google

Note: *Computational Thinking (CT) can be defined as combining problem solving and design to create useful solutions, informed by the possibilities that Computing offers.* (NCCA, 2018)
https://ncca.ie/media/3937/ncca-coding-in-primary-schools-initiative-research-paper-on-computational-thinking-final.pdf