

Supplementary Material

1 SUPPLEMENTARY FIGURES

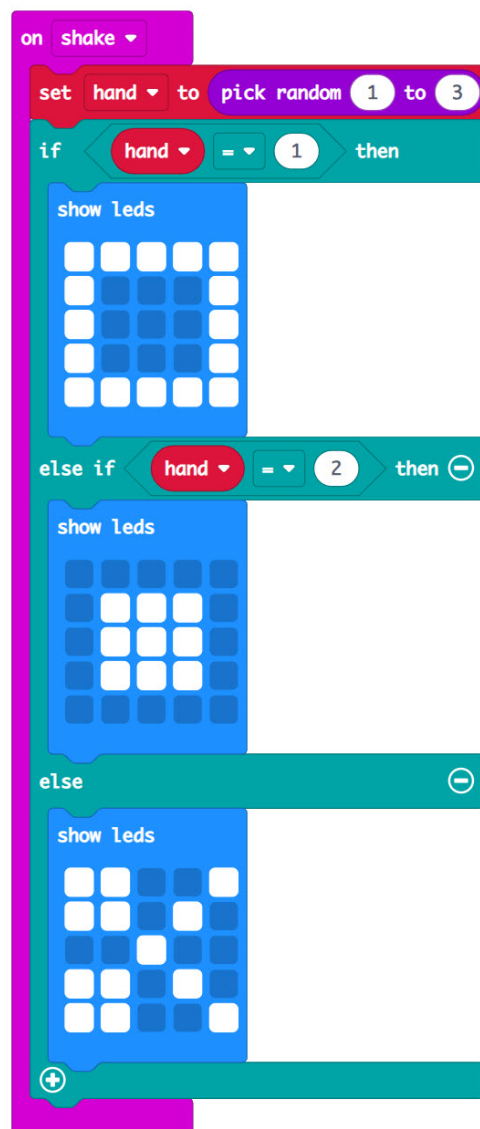
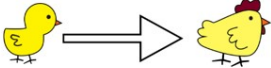



Figure S1. Rock-Paper-Scissors: Sample artifact for unit 3 with block-based Makecode programming environment. Source: Micro:bit Educational Foundation, 2022 , https://makecode.microbit.org/_JR3MtvTrMFX4. Reproduced with permission.

25


















Take the chicken with his mother.

Meaning example:

 While the chicken is in a triangle, it **always** moves to the right.

Mark the correct sequence:

A	B	C	D
			
			
			
			

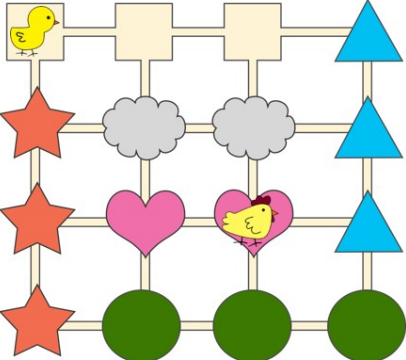
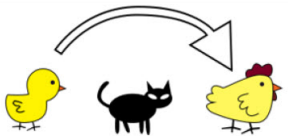











Figure S2. Sample question Q25 from BCTt assessing the program constructs *loops* (while) and *conditions* (always).
Source: Zapata-Cáceres, M., Martín-Barroso, E., and Román-González, M. (2020). "Computational thinking test for beginners: design and content validation," in 2020 IEEE Global Engineering Education Conference (EDUCON) (Porto), 1905–1914. Reproduced with permission.

EXAMPLE, SET 2: SIMPLE LOOP



Take the chicken with his mother.
Beware of the cat: don't go through its square.

Mark the correct sequence:

A	B	C	D
1x 	1x 	2x 	1x 
2x 	1x 	2x 	2x 
	1x 		

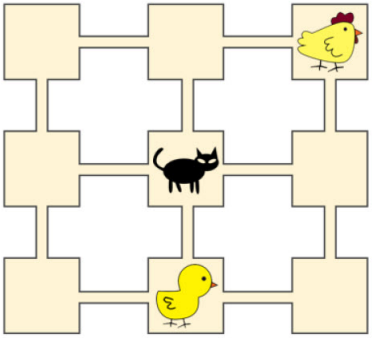


Figure S3. Sample explanation upfront assessment questions 7-11 from BCTt assessing the program constructs – *simple loops*.
Source: Zapata-Cáceres, M., Martín-Barroso, E., and Román-González, M. (2020). "Computational thinking test for beginners: design and content validation," in 2020 IEEE Global Engineering Education Conference (EDUCON) (Porto), 1905–1914. Reproduced with permission.