



# Computer Programming



# National Curriculum PoS



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## Key stage 1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs



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## Key stage 2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs



# Algorithms and Precise Instructions



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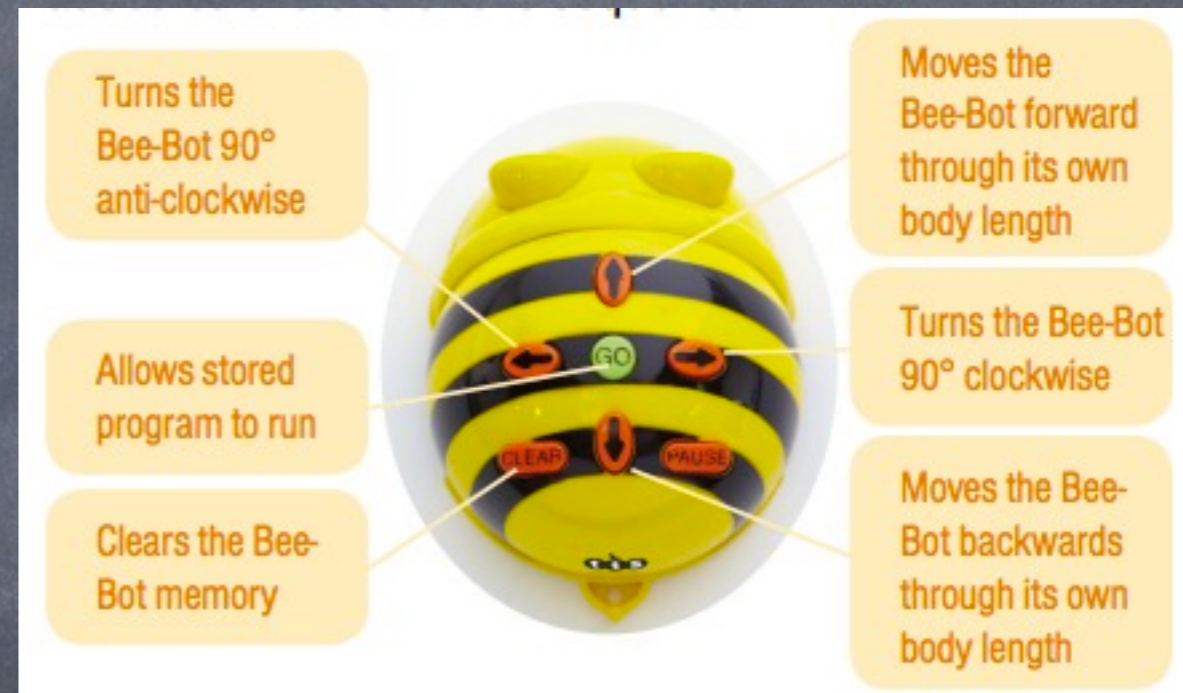




*Which language is right for which key stage?*

The table below illustrates a progressive approach to programming languages in a primary setting.

Key stage	Language type	Language
Early Years/KS1	Device-specific	Bee-Bot
		Roamer-Too
KS1	Limited instruction	ScratchJr
		Lightbot™
KS2	Game programming	Kodu
	Block-based	Scratch
	Text-based	Logo
		TouchDevelop



Whilst there's much to be said for letting pupils explore several programming languages, it's important that they develop a degree of fluency in one, fairly general-purpose language, so that this becomes a medium in which they can solve problems, get useful things done and work creatively.



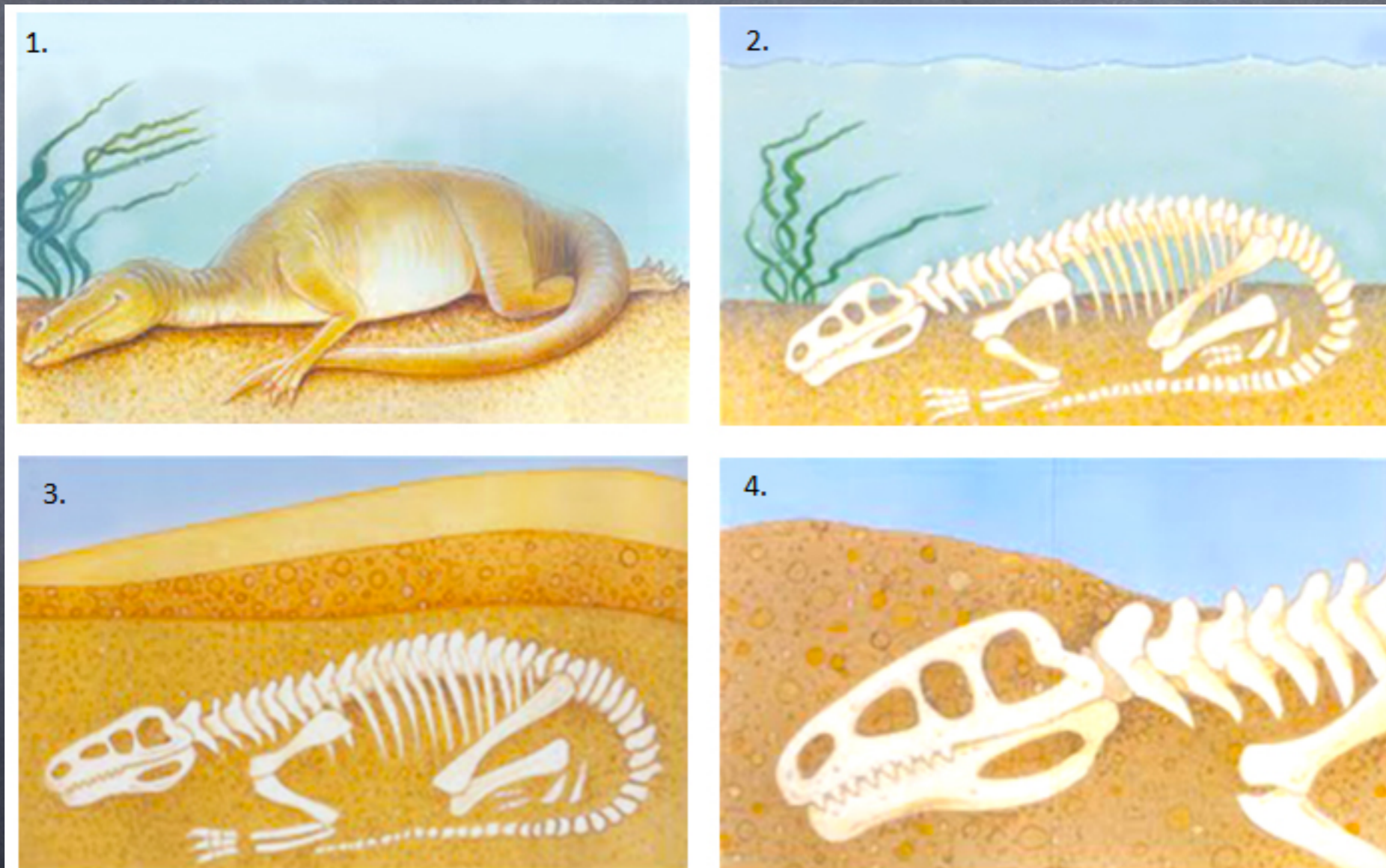
# Create and Debug Simple Programs



[tinyurl.com/pizzaPickle](https://tinyurl.com/pizzaPickle)



# Design and Write Programs with Specific Goals





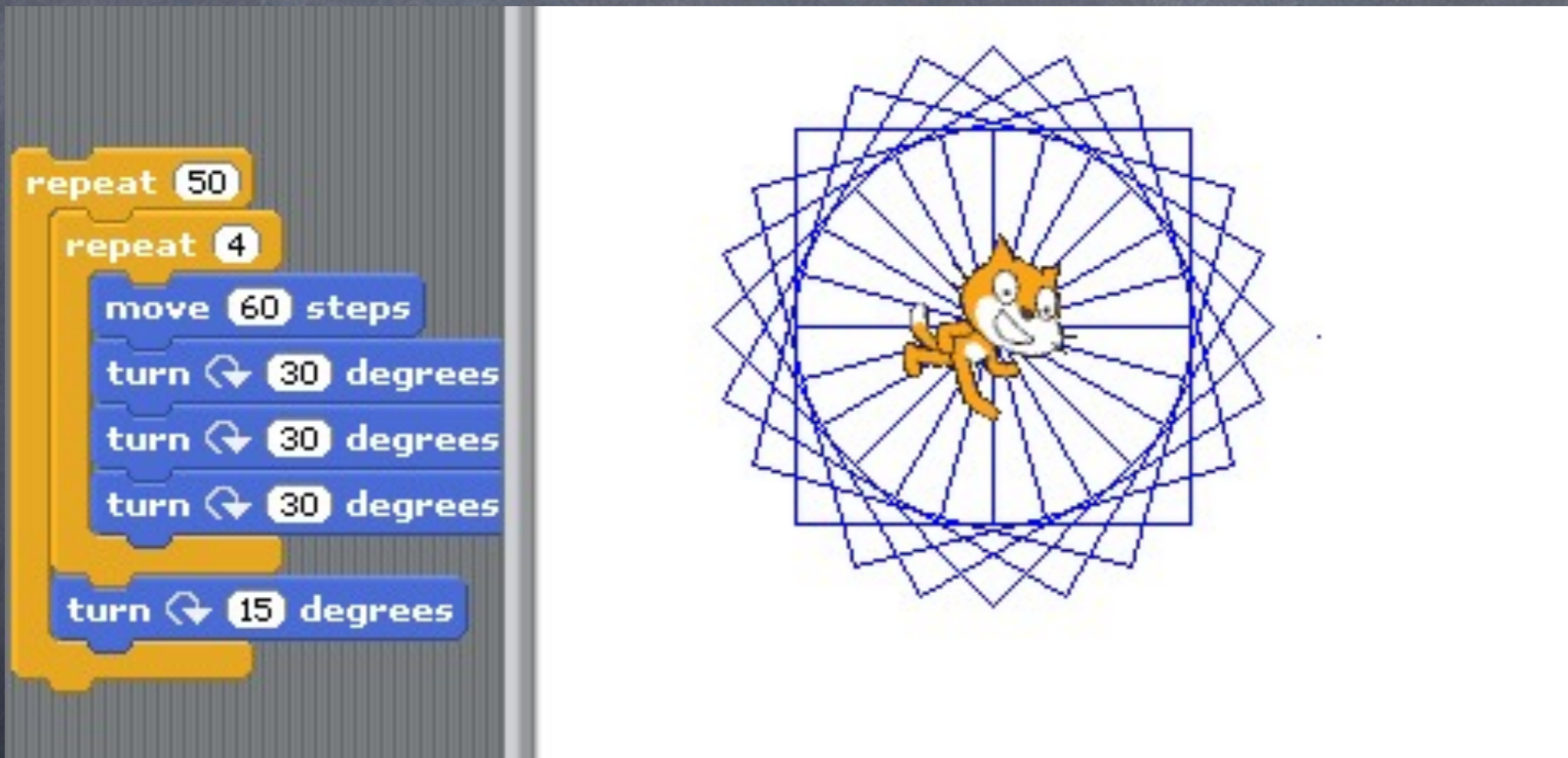
# Design and Write Programs with Specific Goals



[scratch.mit.edu/projects/25872592/](https://scratch.mit.edu/projects/25872592/)  
[tinyurl.com/vikingAnimation](https://tinyurl.com/vikingAnimation)



# Use Repetition in Programs



The image displays a Scratch script on the left and its resulting drawing on the right. The script is as follows:

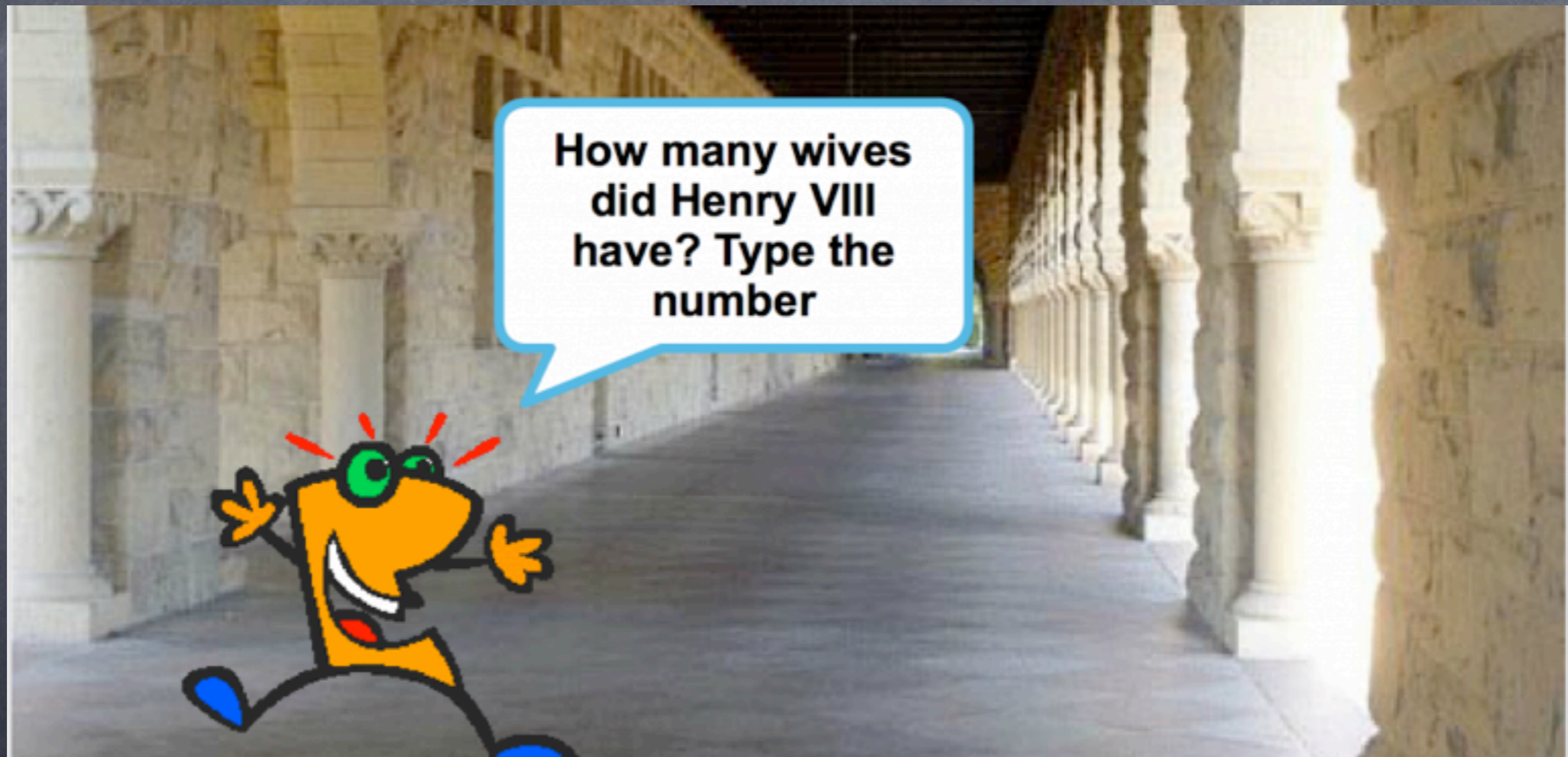
```
repeat 50  
  repeat 4  
    move 60 steps  
    turn 30 degrees  
    turn 30 degrees  
    turn 30 degrees  
  turn 15 degrees
```

The drawing on the right shows a blue geometric pattern of overlapping squares, creating a complex, star-like shape. A small orange Scratch cat character is positioned in the center of the pattern.

[tinyurl.com/crystalFlowers](http://tinyurl.com/crystalFlowers)



# Work with Variables



[tinyurl.com/scratchMaths](http://tinyurl.com/scratchMaths)



# Resources:

- [pi.mwclarkson.co.uk](http://pi.mwclarkson.co.uk)
- Quickstart Computing
- Barefoot Computing
- BBC Bitesize