

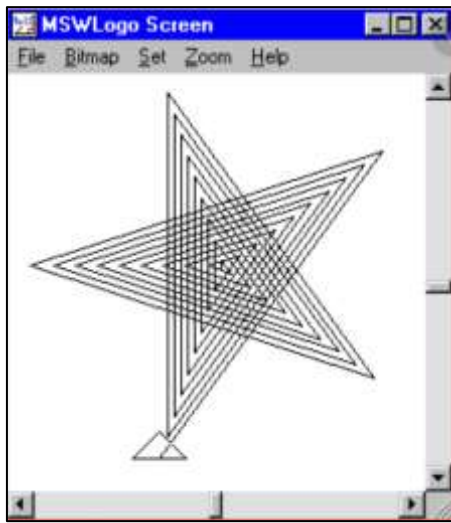


# COMPUTING: PROGRAMMING

## KNOWLEDGE ORGANISER



### Overview

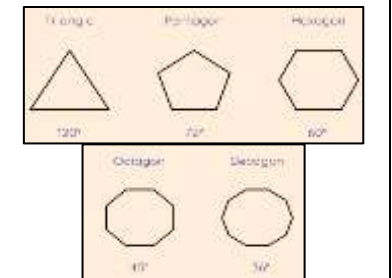
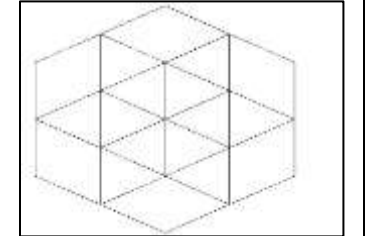
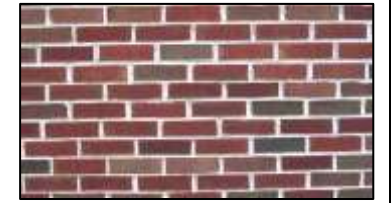


#### Repetition in Shapes

- Programming is when we make a set of instructions for computers to follow.
- Logo is a text-based program that we can use in order to create shapes and patterns.
- We use algorithms (a set of instructions to perform a task) which we can plan, model and test, in order to create accurate and imaginative shapes and patterns.

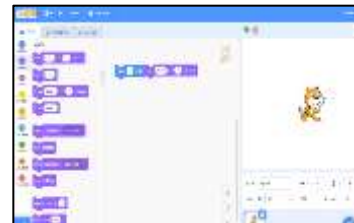
### Programming Patterns

- **Patterns:** Patterns are things that repeat in a logical way. In everyday life, patterns are everywhere!
- **Patterns in Logo:** Instead of typing in the code to create each individual shape, we can save time by repeating a sequence of instructions. We use the 'repeat' function.
- **Repeat:** Type the command 'repeat' — this repeats commands a set number of times. The number following repeat is the number of times to repeat the code, and the code to be repeated is in square brackets, e.g. repeat 4 [FD 100 LT 90]
- **Creating Shapes and Loops:** To make shapes, we need to know the angles of corners of different shapes (see right). Using the repeat function with shapes can help us to make spirals.

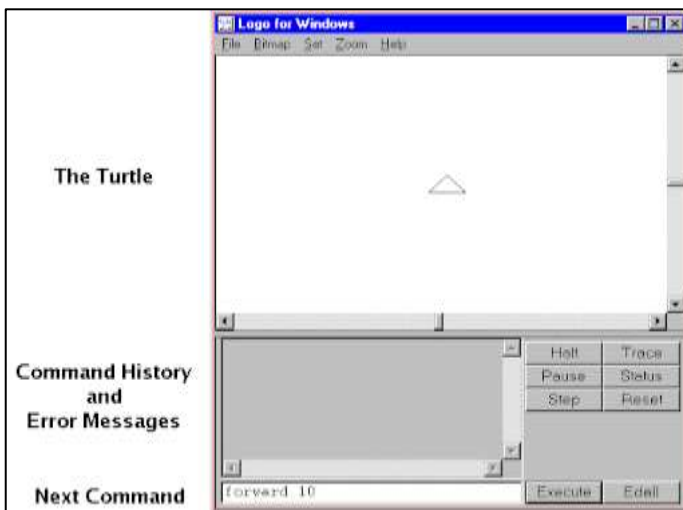


### The Basics of FMS Logo

- **What is FMS Logo?** Logo is a text-based programming language, where we can type commands which are then drawn on the screen.
- Logo helps us to learn how to use programming language, whilst also being creative and using problem-solving skills.



#### The Display:



#### Basic Commands:



- **FD:** Forwards. Always followed by a space and the number of steps, e.g. FD 50
- **BK:** Backwards. As above, e.g. BK 50
- **LT:** Left turn. Always followed by a space and then the degrees to turn, e.g. LT 90
- **RT:** Right turn. As above, e.g. RT 90
- **CS:** Clears any pen marks on your screen and gets the turtle back to the centre.
- **PU:** Stops turtle from leaving a pen trail.
- **PD:** Makes turtle leave a pen trail again.

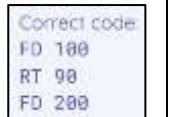
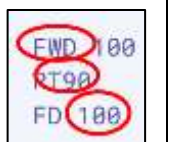
### Sequencing and Algorithms

- A **sequence** is a pattern or process in which one thing follows another.
- We design **algorithms** (sets of instructions for performing a task) to help us program the sequence that we require to achieve our desired outcomes.
- **Programming** is the process of keying in the code recognized by the computer (using your algorithm).



### Trialling and Debugging

- Programmers do not put their computer programs straight to work. They **trial** them first to find any errors:
- **Sequence errors:** An instruction in the sequence is wrong or in the wrong place.
- **Keying errors:** Typing in the wrong code.
- **Logical errors:** Mistakes in plan/thinking.
- If your algorithm does not work correctly the first time, remember to **debug** it.



### Important Vocabulary

Programming

Logo

Turtle

Commands

Code

Cursor

Algorithm

Pattern

Sequence

Debugging