



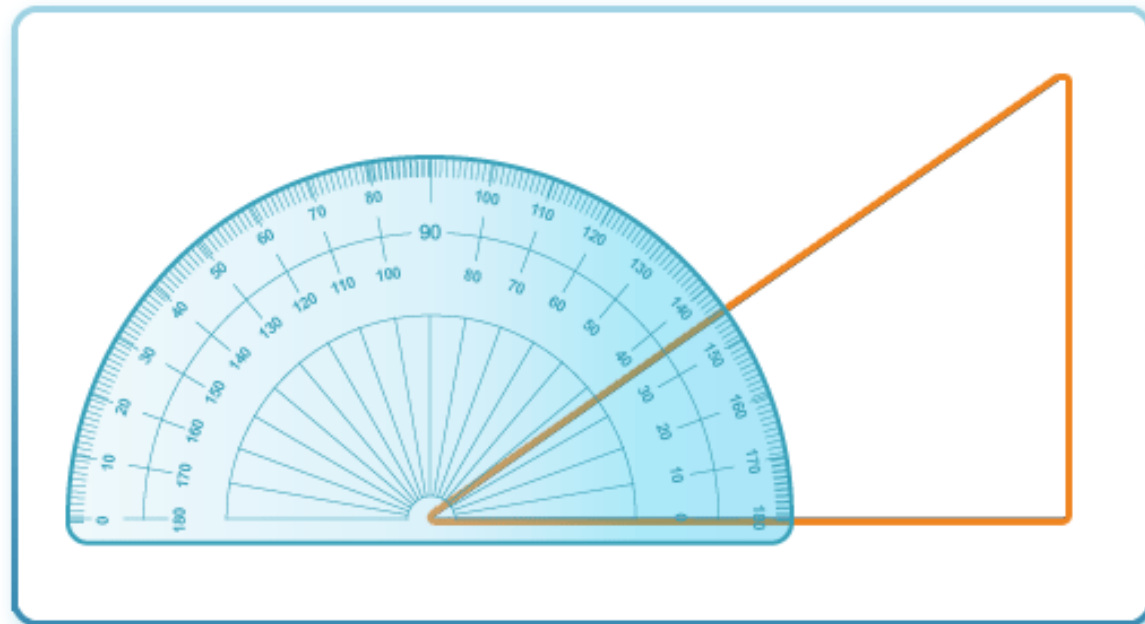
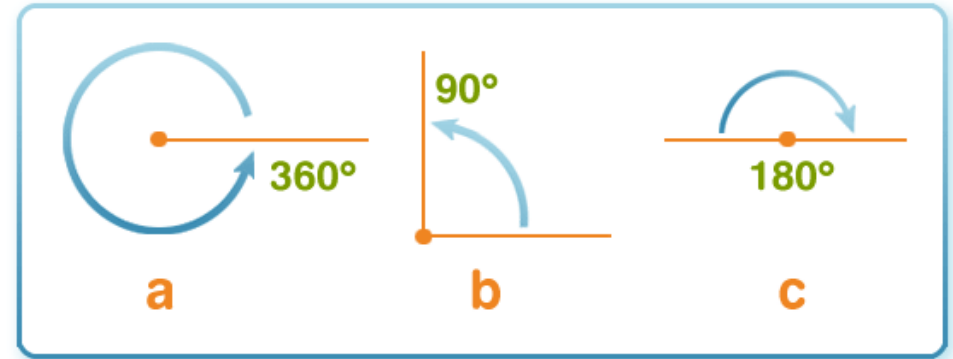
# Programming using Logo

YEAR 3 & 4

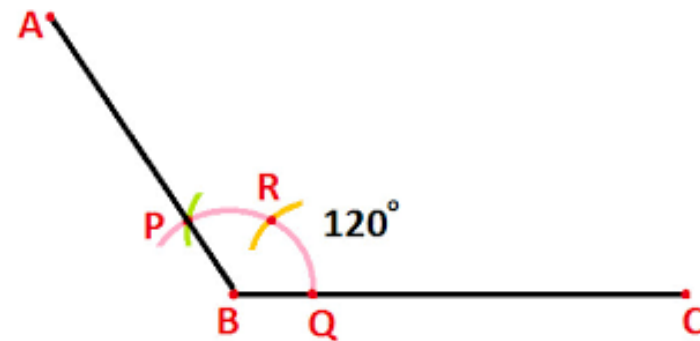
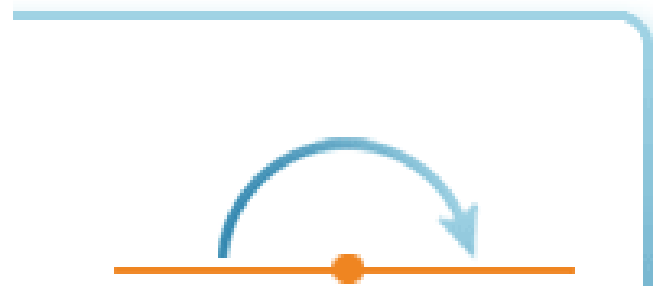
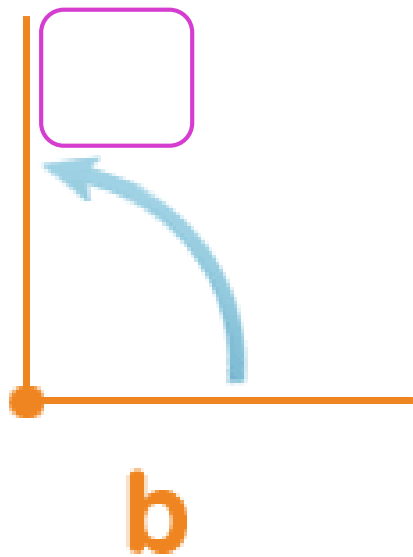
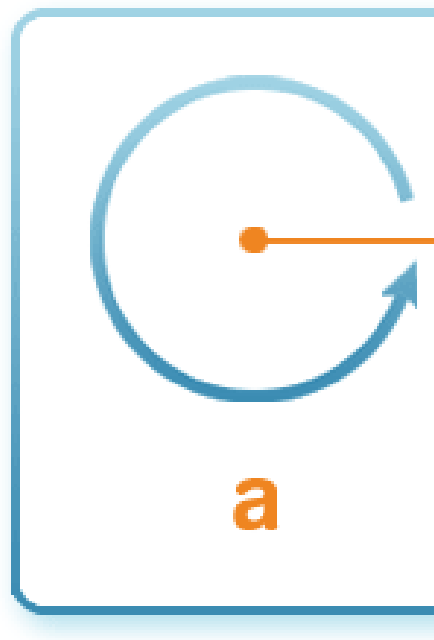
# Week 1

## Purple Mash Logo

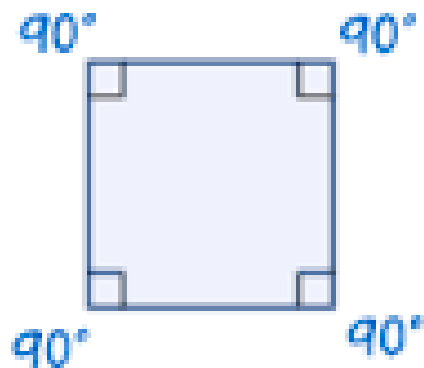
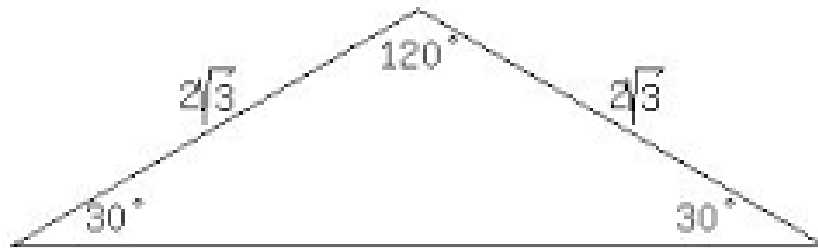
$45^\circ$   
 $90^\circ$   
 $180^\circ$   
 $270^\circ$   
 $360^\circ$



# Week 1



Angles – divide by number of sides  $180 -$   
 $360$



360

4 sides = 90

3 sides = 120

5 side = 72

# Lesson 1

To learn the structure of the language of Logo. To input simple instructions in Logo.

- ▶ Know what the common algorithms (instructions/commands) are in Logo and how to type them in.
- ▶ Can demo how to program Logo algorithms to make sprite move around the maze.
- ▶ Know that a turn is represented by programming in a  $90^\circ$  (degree) code.

Today you will move the sprite around the maze using Logo abbreviations of algorithms (instructions/code).

# Week 1

- ▶ Learn common commands and constructs of the Logo programming language.
- ▶ Develop ability to compose algorithms for drawing mathematical structures and turn these into Logo code.
- ▶ Discuss what an algorithm is (instructions/ commands)
- ▶ Remind what a  $90^\circ$  turn is demo together
- ▶ Understand the abbreviated code `FD 5 RT 90 LT 90 LT 90 FD 7`
- ▶ Today's task The **Minotaur Maze**
- ▶ PLAY – RESET – CHECK – buttons work

## Logo Commands

fd (forward)

bk (backwards)

rt (right)

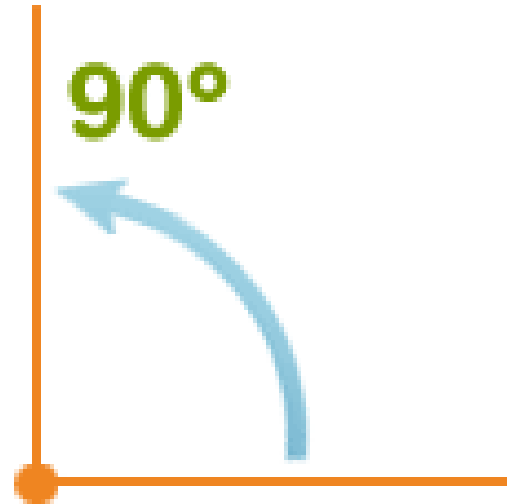
lt (left)

rpt (repeat)

pd (pen down)

pu (pen up)

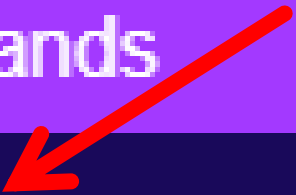
setpc (pen colour)



- Abbreviated algorithms – can type in or click on the code in Logo Commands box.
- Then type the number of moves or the degree turn.
- Press space in between code and numbers.



## Logo Commands

fd (forward)   
bk (backwards)  
rt (right)  
lt (left)


- Abbreviated algorithms – can type in or click on the code in Logo Commands box.
- Then type the number of moves or the degree turn.
- **Press space in between code and numbers.**

```
> FD 2 rt 90 fd 6 lt 90 fd 5 fd rt
```



# Week 1 - The Minotaur Maze

https://www.parplemash.com/map/tools/logo\_challenge\_1



The screenshot shows a 3D-rendered maze on a grid. A Minotaur is in the center. A red line traces a path from the start (bottom-left) to the goal (top-right). A green arrow points up from the start. The interface includes a toolbar with a grid icon, a play button, a refresh button, a checkmark button, a speed slider (slow to fast), and icons for help, monitor, and back. A 'Logo Commands' panel on the right lists commands: fd (forward), bk (backwards), rt (right), lt (left), rpt (repeat), pd (pen down), pu (pen up), and setpc (pen colour). A 'My Procedures' panel with a plus icon is also present. The command input area at the bottom shows the command: > FD 2 rt 90 fd 6 lt 90 fd 5 fd rt

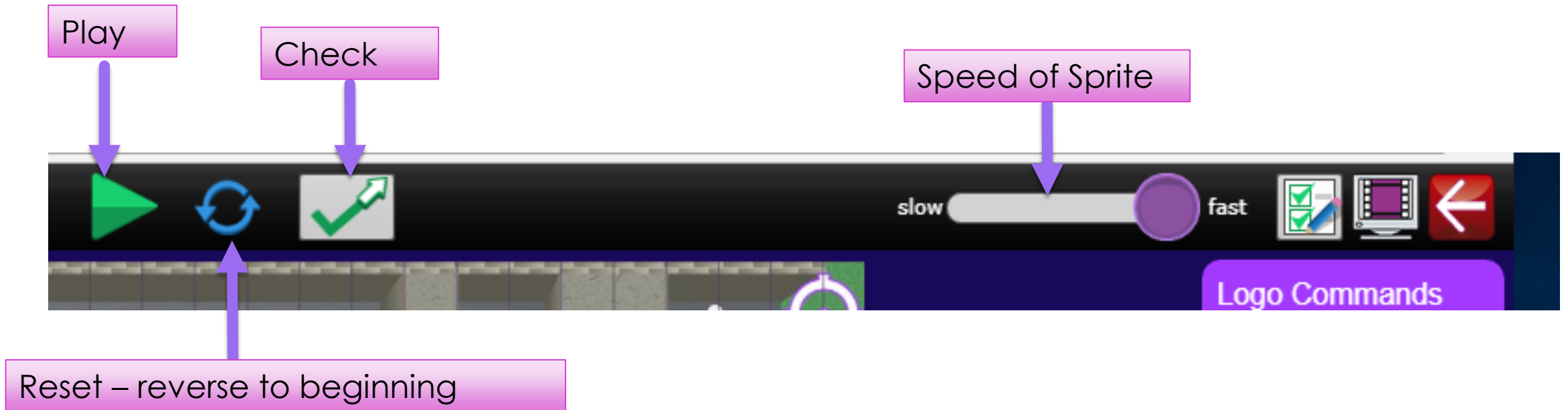
Logo Commands

- fd (forward)
- bk (backwards)
- rt (right)
- lt (left)
- rpt (repeat)
- pd (pen down)
- pu (pen up)
- setpc (pen colour)

My Procedures +

> FD 2 rt 90 fd 6 lt 90 fd 5 fd rt

# Week 1



## Code in logo

- ▶ FD 5
- ▶ RT 90
- ▶ LT 90
- ▶ FD 5 RT 90 FD 6 LT 90 FD 7 LT 90

# Week 2

- ▶ Can follow Logo code to predict the outcome.
- ▶ Can create shapes using the Repeat function.
- ▶ Can find the most efficient way to draw shapes.

# Week 2

- ▶ I can.....Confidently define what an algorithm is
- ▶ I can....Successfully input the correct command to move the sprite in the precise direction
- ▶ I can effectively predict the correct outcome of the commands I have generated
- ▶ I can...efficiently use the repeat function key to navigate the sprite
- ▶ Re-cap what a  $90^\circ$  turn is demo together
- ▶ Enforce that a turn is represented by programming in a  $90^\circ$  (degree) code.
- ▶ Recap the abbreviated code FD 5 RT 90 LT 90
- ▶ Pen up/down abbreviation
- ▶ Introduce today's task The Dream Time

# Week 2 - Coding

- ▶ Go to command
  - ▶ Pen down
  - ▶ Pen up
  - ▶ Colour of pen
- ▶ Be able to demo how to type in fd for forward movement
  - ▶ Be able to type in the correct ° for an angle turn

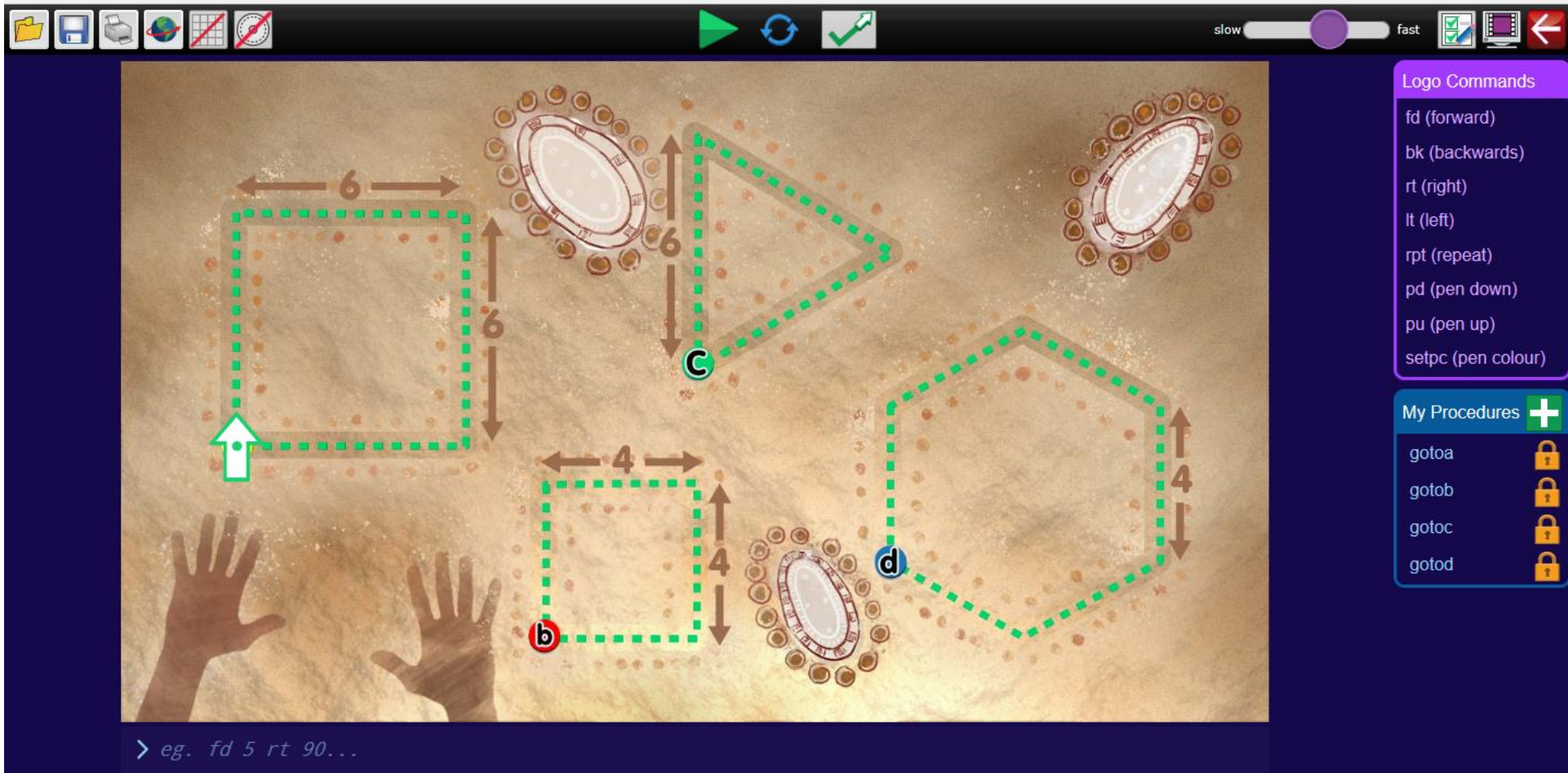
# Lesson 2

- ▶ Using 2Logo to create shapes.
- ▶ Can create Logo instructions to draw patterns of increasing complexity.
- ▶ Understand the pu (pen up) and pd (pen down) commands.
- ▶ This week's task is set as a to do in Purple Mash the name of the task is The Dream time.
- ▶ Watch the video before you begin it will help you to understand the task. Click on the video icon top right hand corner





# Week 2 - Dream time



The image shows a Scratch project window. The main canvas displays a drawing of a cave wall with two hands at the bottom. Several dotted paths are drawn on the wall, each with a letter and a number indicating its dimensions: a square with side 6 (labeled 'a'), a square with side 4 (labeled 'b'), a triangle with side 6 (labeled 'c'), and a hexagon with side 4 (labeled 'd'). There are also three cave drawings of animals. The interface includes a toolbar at the top with icons for file operations, a play button, a loop button, a checkmark, a slider from 'slow' to 'fast', and a 'back' button. On the right, there is a 'Logo Commands' list and a 'My Procedures' list.

Logo Commands

- fd (forward)
- bk (backwards)
- rt (right)
- lt (left)
- rpt (repeat)
- pd (pen down)
- pu (pen up)
- setpc (pen colour)

My Procedures +

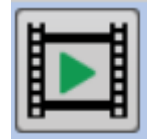
- gotoa
- gotob
- gotoc
- gotod

> eg. fd 5 rt 90...



# Week 3 - Coding

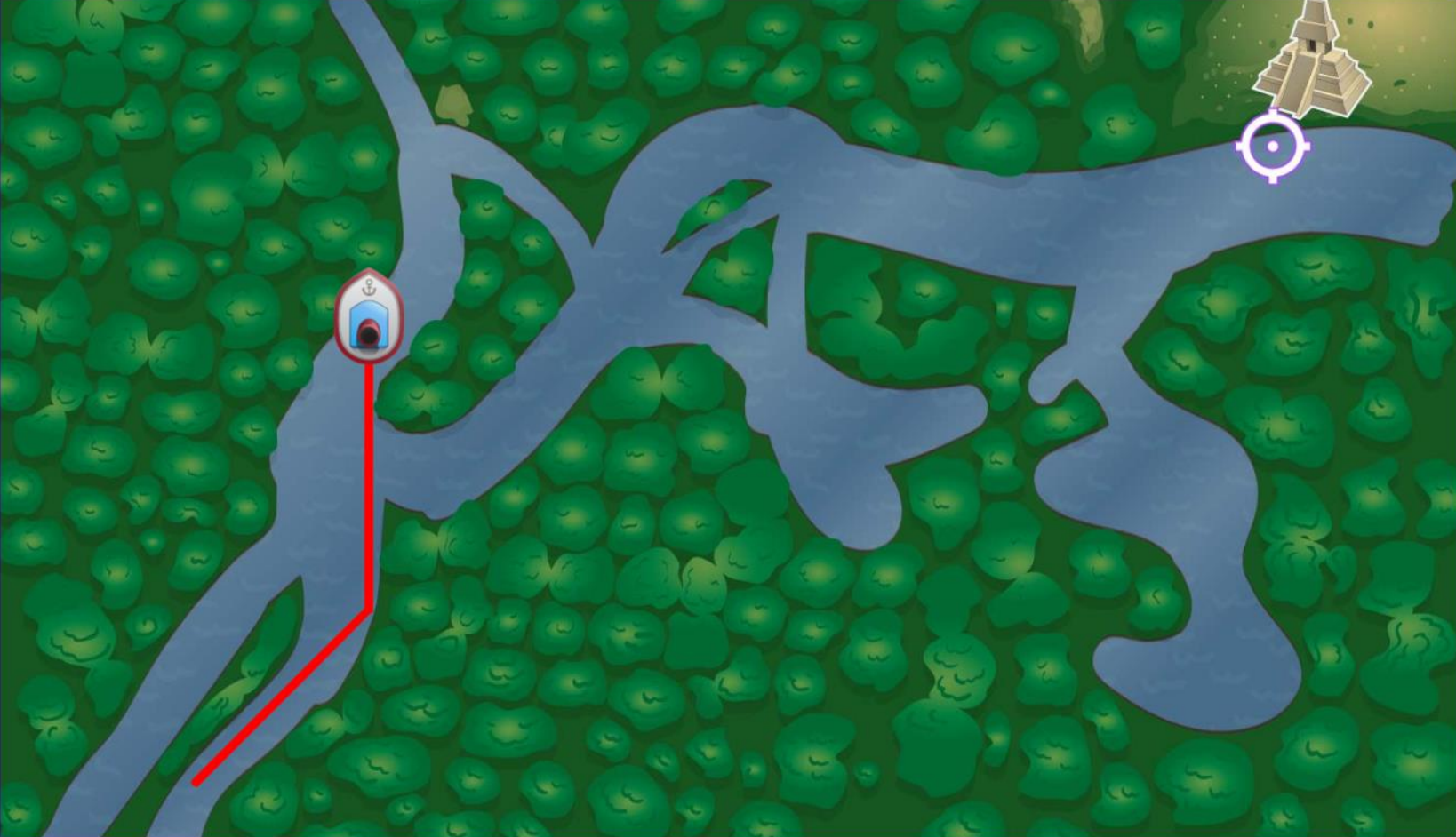
- ▶ Enforce that a turn is represented by programming in a  $90^\circ$  (degree) and  $45^\circ$  (degree) code.
- ▶ Introduce today's task River Rapids
- ▶ Watch the video before you begin it will help you to understand the task. Click on the video icon top right hand corner



# Week 3 - Coding

- ▶ Go to command
  - ▶ Pen down
  - ▶ Pen up
  - ▶ Colour of pen
- ▶ Be able to demo how to type in fd for forward movement
  - ▶ Be able to type in the correct  $90^\circ$  or  $45^\circ$  for an angle turn
  - ▶ Be able to click on the correct go to procedure

# Week 3 – Coding River Rapids



The image shows the Scratch programming environment. The main stage displays a river rapids scene with a blue river flowing through a green, rocky landscape. A small boat icon is positioned on the left side of the river, and a target icon is on the right. A red line indicates a path from the boat towards the target. The top toolbar includes icons for file operations, a play button, a reset button, a checkmark, and a speed slider set to 'slow'. On the right side, the 'Logo Commands' menu is open, showing a list of commands: fd (forward), bk (backwards), rt (right), lt (left), rpt (repeat), pd (pen down), pu (pen up), and setpc (pen colour). Below this is the 'My Procedures' section with a plus icon. At the bottom, the command input field contains the text: > rt 45 fd 5 lt 45 fd 6|

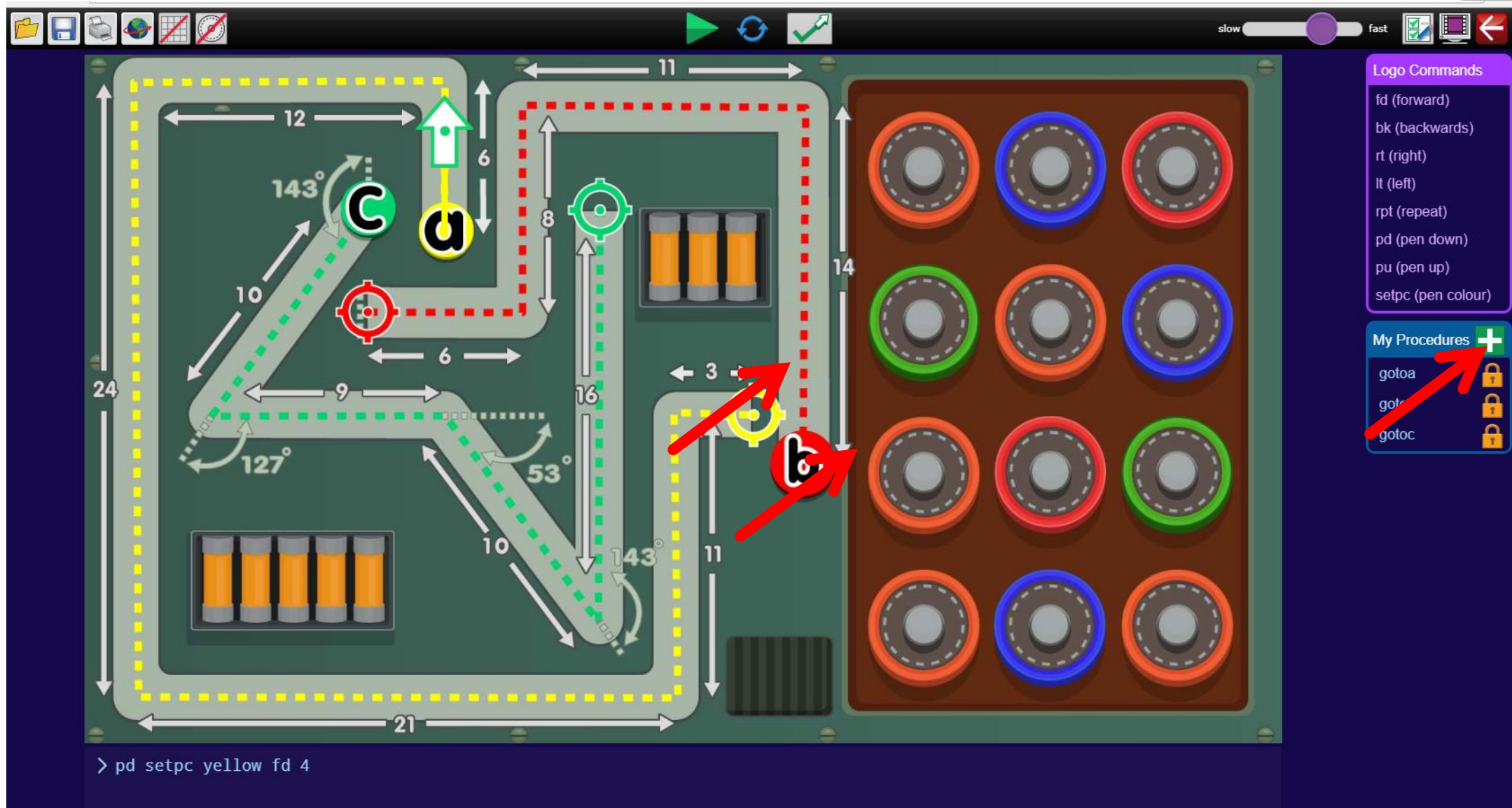
Logo Commands

- fd (forward)
- bk (backwards)
- rt (right)
- lt (left)
- rpt (repeat)
- pd (pen down)
- pu (pen up)
- setpc (pen colour)

My Procedures +

> rt 45 fd 5 lt 45 fd 6|

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26



## Logo Commands

fd (forward)  
bk (backwards)  
rt (right)  
lt (left)  
rpt (repeat)  
pd (pen down)  
pu (pen up)  
setpc (pen colour)

## My Procedures



gotoa



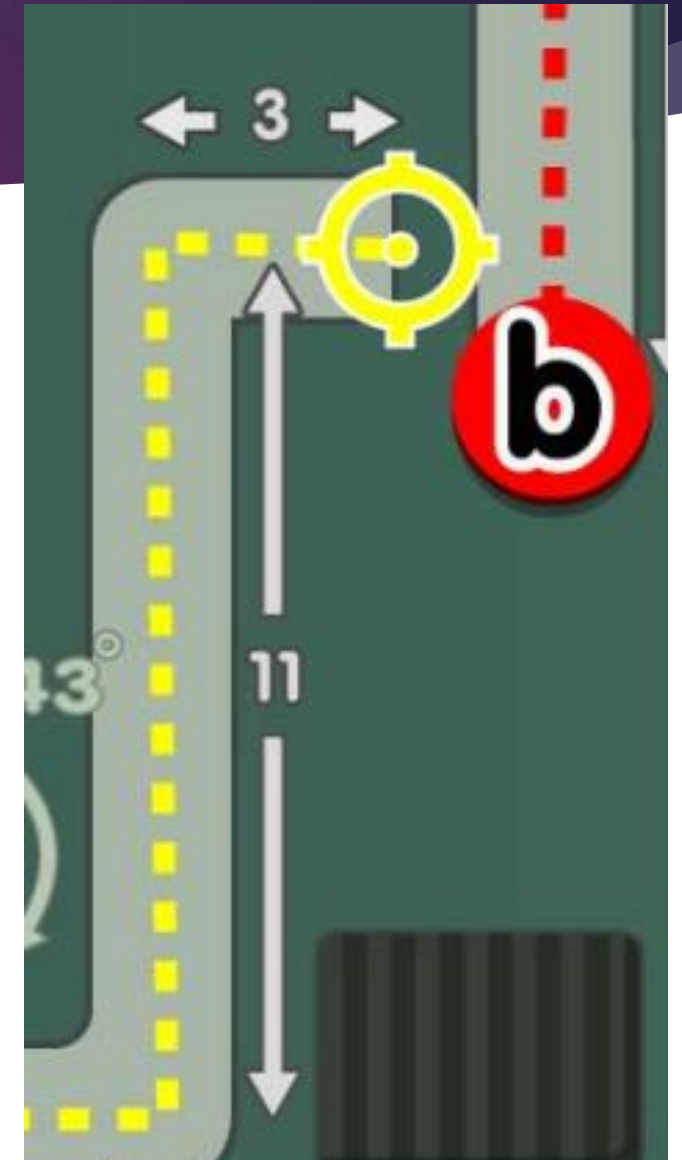
gotob



gotoc



- ▶ Jump from course A when it ends to the start of course B
- ▶ By using the **gotob** code in MY PROCEDURES





# Flags: Starting a point a plot your algorithms to point d

The image shows a Scratch project titled "4. Sir Francis' Flags". The stage features a ship with four flags. A path is drawn from point 'b' (a red circle on the first flag) to point 'd' (a blue circle on the fourth flag). The path consists of several segments with specific lengths and angles: a segment of length 10 at an angle of 143°, a segment of length 'b' at an angle of 150°, a segment of length 'a' at an angle of 120°, and a final segment of length 'a' at an angle of 150°. The path is shown as a dashed green line. The Scratch interface includes a toolbar at the top with icons for file operations, a play button, a reset button, and a checkmark. A speed slider is set to "slow". On the right side, there are two panels: "Logo Commands" and "My Procedures".

**Logo Commands**

- fd (forward)
- bk (backwards)
- rt (right)
- lt (left)
- rpt (repeat)
- pd (pen down)
- pu (pen up)
- setpc (pen colour)

**My Procedures**

- gotoa
- gotob
- gotoc
- gotod

# Protect the planets

The interface features a top toolbar with icons for file operations, a play button, a loop button, a checkmark, a speed slider (slow to fast), and a back button. A table in the top-left corner defines the planets:

Planet Name	Number of segments	Length of each segment	Angle of turn
Decca	10		36
Triakonta	30	2	
Enenekonta		1	4

The main workspace shows a space scene with three planets: Decca (orange), Triakonta (blue), and Enenekonta (red). Each planet is surrounded by a dashed green circular path. A small rocket ship is at the bottom left. The right panel contains two sections: 'Logo Commands' with a list of commands (fd, bk, rt, lt, rpt, pd, pu, setpc) and 'My Procedures' with a list of procedures (gotoa, gotob, gotoc, decca, triakonta, enenekonta). The 'gotoa', 'gotob', and 'gotoc' procedures are locked (indicated by a padlock icon), while 'decca', 'triakonta', and 'enenekonta' are editable (indicated by a pencil icon). Two red arrows point from the 'My Procedures' list to the 'decca' and 'triakonta' procedures. At the bottom left, a command input field shows the example: `> eg. fd 5 rt 90...`