



Look at the algorithm below. Answer the questions and then predict what parts of the algorithm will do when converted into code

Define <b>check_keys_for_steering</b> If use right arrow key Turn 15 degrees to the right If use the left arrow key Turn 15 degrees to the left	Define <b>check_end_game</b> If the red colour on the crab is touching pink End everything in the game
Define <b>send_crab_to_start</b> Send crab to start using x and y Point down 180 Move backwards 5 steps	Define <b>check_next_level</b> if red colour on crab touching green at end Change the backdrop Run <b>send_crab_to_start</b> procedure Broadcast come_back_money
Define <b>do_moving</b> Move forwards one step	Define <b>do_crab_animation</b> Change to the next crab costume Pause for 0.3 second

**Read & Predict Algorithm Questions**

- 1, Circle the two parts of the algorithm that steers right
- 2, Put a box around the two part of the algorithm that end the game
- 3, Draw arrows to point to the two parts of the algorithm that move the crab
- 4, Put a star next to the two parts of the algorithm that animate the crab costume
- 5, Put wiggly lines around the two parts of the algorithm that repeat things continuously
- 6, Now write what each procedure does once converted into code inside its box above

Main program algorithm

- Start with green flag
- Go to start backdrop
- Go to x163 and y 114 position on screen
- Point down 180 degrees
- Loop always
  - do\_moving** procedure
  - check\_keys\_for\_steering** procedure
  - check\_next\_level** procedure
  - check\_end\_game** procedure

Main program algorithm

- Start with green flag
- Loop always
  - do\_crab\_animation** procedure

Now mark your use work using the answer sheet

Name

**New Crab Maze**  
**PRIMM ALGORITHM Page 2**  
Start Scratch and load  
newcrabmaze



**INVESTIGATE the code** (Run the programs lots of times but don't change the code)

Look at the code inside the crab sprite only

**Crab Sprite Questions**

- 1, How many procedures are there? *HINT start with define, curved at top*
- 2, How many blocks start/run a procedure *HINT Name of procedure without define or curved top*
- 3, Which procedure is only started/run when the colour red is touching the colour green?
- 4, How many procedures are inside continuous indefinite (forever) loops?
- 5, Name two **condition-starts-action** (if then) that are checked continuously throughout the program?
- 6, Name three blocks that are initialisation (designed to set the program back to how it looked and ran when it was first run).

Look at the code inside the money sprite only

**Money Sprite Questions**

- 7, How many procedures are there? *HINT start with define, curved at top*
- 8, Which code block sets **how many** money clones are created?
- 9, Which **condition-starts-action** are checked continuously within a loop?
- 10, What causes a money clone to be deleted?
- 11, Look at all the blocks that start the procedures in the money sprite which order do they first run in? Number them 1,2,3 in the order they are run or checked.  
**check\_hit\_by\_crab,**  
**check\_not\_on\_walls\_or\_end,**  
**make\_lots of clones**

Now mark your use work using the USE answer sheet

Name



**MODIFY** (Run the code and make small changes)

### Crab Modify Challenges

- 1, Can you make the crab move faster? What did you change?
- 2, Can you make the crab change costumes slower? What did you change?
- 3, The **do\_crab\_animation** procedure is started/run from inside a separate continuous (forever) loop. Why do you think this it is inside its own forever loop? Try putting the **do\_crab\_animation** start/run block inside the forever loop which starts/runs four other procedures.

### Money Modify Challenges

- 4, Can you make 40 money sprites appear for each level? What did you change?
- 5, Can you make the score increase by 10 points every time a money clone touches the crab? What did you change?
- 6, In your own words explain what the **check\_not\_on\_walls\_or\_end** procedure does? Try playing the program after disconnecting the block to see how the program runs without it.

Now mark the **modify** questions using the answer sheet

### Modify More Challenges

- 1, Change the **check\_keys\_for\_steering** procedure so that one key turns either right or left. What did you change?
- 2, Change the **check\_end\_game** procedure so that when the red of the crab touches the pink wall it goes back to the start. What did you change?

Now mark the **modify more** questions using the answer sheet

Name



**MAKE INSIDE** (Create additions to newcrabmaze)

Complete two or more of the challenges. Tick the challenges you have completed or fill in the box at the bottom to explain your own.

**Player Vs Player PVP Game**

**Duplicate the crab** (right click on the crab sprite and select duplicate)

Adapt the game so that the new crab has to catch the old crab to end the game. Change the code so the new crab can steer using different keys and is a different colour. Change the code so the new crab starts is hidden for so many seconds after the red crab starts. Can you make a new procedure to make the new crab pass through the pink walls very slowly and not end the game when it touches the walls.

**More Money**

**Duplicate the money sprite**

Change the colour. Change the code so that the new sprite appears anywhere apart from the end green colour. Change the score when it touches a crab to 50. Make the More Money clone hide and reveal itself randomly.

**Moving Pink Obstacles**

Create new pink shape sprites. Code these so they glide slowly from one area to another continuously or rotate slowly. What will they do then they meet the crab(s)?

**My Modification**

Create your own modification to improve the game and say what it did underneath.

For extra hints see the create inside hints sheets or ask your teacher

You can share design ideas but must  
plan and code separately



**MAKE NEW**

Design and code your own game that uses **procedures**.  
You can adapt any ideas from any other games you have studied.

**Idea Level** *My game will... My characters will be... The aim of the game will be...*

**Design Level** (Draw your game simply and name each procedure and what it will do)

Write **procedure** algorithms that you might need near your design drawings.

**Initialisation** Jot down how your sprites will always start in the same place

Name

**New Crab Maze**  
**PRIMM ALGORITHM Page 1 ANSWERS**



Look at the algorithm below. Answer the questions and then predict what parts of the algorithm will do when converted into code

Define <b>check_keys_for_steering</b> If use right arrow key Turn 15 degrees to the right If use the left arrow key Turn 15 degrees to the left <b>steers right and left (1 mark)</b>	Define <b>check_end_game</b> If the red colour on the crab is touching pink End everything in the game  <b>Ends game (1 mark)</b>
Define <b>send_crab_to_start</b> Send crab to start using x and y Point down 180 Move backwards 5 steps <b>Sends crab to start (1 mark)</b>	Define <b>check_next_level</b> if red colour on crab touching green at end Change the backdrop Run <b>send_crab_to_start</b> procedure Broadcast come_back_money <b>Stars a new level (1 mark)</b>
Define <b>do_moving</b> Move forwards one step ← <b>Moves (1 mark)</b>	Define <b>do_crab_animation</b> ★ Change to the next crab costume Pause for 0.3 second <b>animation (1 mark)</b>

**Read & Predict Algorithm Questions**

- Circle the two parts of the algorithm that steers right (2 marks)
- Put a box around the two part of the algorithm that end the game (2 marks)
- Put straight lines underneath the two parts of the algorithm that move the crab (2 marks)
- Put a star next to the two parts of the algorithm that animate the crab costume (2 marks)
- Put wiggly lines around the two parts of the algorithm that repeat things continuously (2 marks)
- Now write what each procedure does once converted into code inside its box above (possible 6 marks)

**Main program algorithms**

- Start with green flag
- Go to start backdrop
- Go to x163 and y 114 position on screen
- Point down 180 degrees
- Loop always
- do\_moving procedure ←
- check\_keys\_for\_steering procedure
- check\_next\_level procedure
- check\_end\_game procedure

- Start with green flag
- Loop always
- ★ do\_crab\_animation procedure

Now mark your use work using the PARSONS answer sheet if you got anything wrong fix it.

Name

## INVESTIGATE ANSWERS

### Crab Sprite Questions

1, How many procedures are there? *HINT start with define, curved at top*

6 (1 mark)

2, How many blocks start/run a procedure *HINT Name of procedure without define or curved top*

6 (1 mark)

3, Which procedure is only started/run when the colour red is touching the colour green?  
send\_crab\_to\_start (1 mark)

4, How many procedures are inside continuous indefinite (forever) loops?

5 (1 mark) if you put 6 because you counted the send\_crab\_to\_start as inside another procedure that is within a continuous loop then also have 1 mark

5, Name two **condition-starts-action** (if then) that are checked continuously throughout the program?

Any two from if key right arrow pressed, if key left arrow pressed, if colour red is touching pink, if colour red is touching green (1 mark, if you have described them by what they do such as steer right that is fine)

6, Name three blocks that are initialisation (designed to set the program back to how it looked and ran when it was first run).

Switch backdrop to start, go to x163 and y114, point in direction 180 (1 mark)

### Money Sprite Questions

7, How many procedures are there? *HINT start with define, curved at top*

3 (1 mark)

8, Which code block sets **how many** money clones are created?

Repeat 20 (1 mark)

9, Which **condition-starts-action** are checked continuously within a loop?

If touching crab, if touching pink or green (1 mark for each, 2 marks total)

10, What causes a money clone to be deleted?

If it touches the crab sprite, no mark for the delete the clone block without saying that it touches the crab sprite (1 mark)

11, Look at all the blocks that start the procedures in the money sprite which order do they first run in? Number them 1,2,3 in the order they are run or checked.

check\_hit\_by\_crab, 2

check\_not\_on\_walls\_or\_end, 3

make\_lots\_of\_clones 1

(1 mark for all three in the correct order)

## New Crab Maze PRIMM ALGORITHM MODIFY ANSWERS

**MODIFY** (Run the code and make small changes)

### Crab Modify Challenges

1, Can you make the crab move faster? What did you change?

Change move 1 step to a higher number (1 mark)

2, Can you make the crab change costumes slower? What did you change?

Change wait 0.3 secs to a higher number (1 mark)

3, The **do\_crab\_animation** procedure is started/run from inside a separate continuous (forever) loop. Why do you think this it is inside its own forever loop? Try putting the **do\_crab\_animation** start/run block inside the forever loop which starts/runs four other procedures.

The wait block slows the forever loop down which slows all the other procedures making the game run very slowly (1 mark)

### Money Modify Challenges

4, Can you make 40 money sprites appear for each level? What did you change?

Change repeat 20 to repeat 40 (1 mark)

5, Can you make the score increase by 10 points every time a money clone touches the crab? What did you change?

Modify change score by 1 to change score by 10 (1 mark)

6, In your own words explain what the **check\_not\_on\_walls\_or\_end** procedure does? Try playing the program after disconnecting the block to see how the program runs without it. Makes sure the money sprites don't appear touching the walls or green end sprite (1 mark)



## New Crab Maze PRIMM ALGORITHM MODIFY MORE ANSWERS

### Modify More Challenges

1, Change the **check\_keys\_for\_steering** procedure so that one key turns either right or left. What did you change?

Change two if then blocks to just one if else condition-switches-between-actions block (1 mark)

2, Change the **check\_end\_game** procedure so that when the red of the crab touches the pink wall it goes back to the start. What did you change?

Remove stop all and replace with either **send\_crab\_to\_start** or go to x 163 and y 114 block (1 mark)





## New Crab Maze PRIMM ALGORITHM MAKE INSIDE HINT SHEET

# Simple Procedures

### Player Vs Player PVP Game

**Duplicate the crab** (right click on the crab sprite and select duplicate)

Adapt the game so that the new crab has to catch the old crab to end the game. **HINT if touching** Change the code so the new crab can steer using different keys **HINT if key x** and is a different colour **HINT costume editing**. Change the code so the new crab starts is hidden for so many seconds after the red crab starts **HINT Wait**. Can you make a new procedure to make the new crab pass through the pink walls very slowly and not end the game when it touches the walls **HINT Move minus steps**.



---

## New Crab Maze PRIMM ALGORITHM MAKE INSIDE HINT SHEET

# Simple Procedures

### More Money

**Duplicate the money sprite**

Change the colour **HINT costume colouring**. Change the code so that the new sprite appears anywhere apart from the end green colour **HINT if touching pink only**. Change the score when it touches a crab to 50 **HINT change score by**. Make the More Money clone hide and reveal itself randomly **HINT hide and show**.



---

## New Crab Maze PRIMM ALGORITHM MAKE INSIDE HINT SHEET

# Simple Procedures

### Moving Pink Obstacles

Create new pink shape sprites **HINT costume**. Code these so they glide slowly from one area to another continuously or rotate slowly **HINT continuous loop glide to**. What will they do then they meet the crab(s)? **HINT if touching**

