

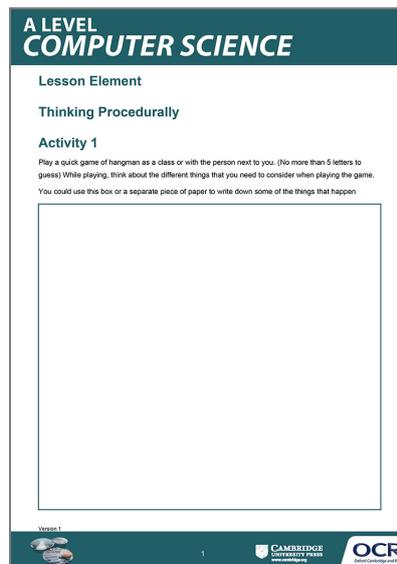
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Lesson Element

Thinking Procedurally

Instructions and answers for teachers

These instructions should accompany the OCR resource 'Thinking Procedurally' activity which supports OCR A Level Computer Science.



The Activity:

Thinking procedurally takes into account that you have decomposed your problem and that you are now going to think of the way that this might be applied to a program in some sort of algorithm.

Learning outcomes

- Identify the components of a problem.
- Identify the components of a solution to a problem.
- Determine the order of steps needed to solve a problem.
- Identify sub-procedures necessary to solve a problem.



This activity offers an opportunity for English skills development.

Associated materials:

'Thinking Procedurally' Lesson Element learner activity sheet.

Suggested timings.

Activity 1: 20 minutes **Activity 2:** 15 minutes **Extension Activity:** 30 minutes + 1 lesson if desired



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Activity 1

The best thing about this activity is that students should already have familiarity with Hangman and so should be able to break the problem apart quite easily.

You could start off by introducing the first activity and then consolidate ideas on a whiteboard before moving onto the next task.

Activity 2

Get students to have a go at filling in the grid. Again, you could discuss afterwards as a class.

Extension

This is an optional activity for both yourself and students. If they have not yet learnt about traversing lists, then this is probably either a good opportunity to teach how to use them, or not a good idea unless students are particularly resilient.

Teacher preparation and additional guidance

Teachers should have a go at finishing the activity themselves first to get a general feel for the way the activities will turn out and whether or not you would like the students to actually start making the Hangman game or not, whether this be in Scratch or Python.



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Attached below is a complete code example of how Hangman can be easily constructed using lists and variables:

3 lists:

- the solved word
- the empty list for guesses and
- the wrongly guessed characters

2 variables:

- guesses remaining
- an iterator variable which we use to traverse our list

You may also choose to give some pseudocode for the activity to students or some hints. (See differentiated student sheet – ‘Guided worksheet of how to make Hangman in Scratch’.)

<http://community.computingschool.org.uk/resources/750> – Python 3 Hangman game at Computing at School – Vikki Dodd

<http://inventwithpython.com/chapter9.html> – Solution for Hangman in Python with breakdown – Al Sweigart

<http://codeboom.wordpress.com/sweet-resources/hangman/> – Solution for Hangman in Python with breakdown – Laura @codeboom



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Completed code screenshot

```
when clicked
  hide variable itr
  set guessesRemaining to 6
  repeat length of word
    delete 1 of word
  repeat length of guessWord
    delete 1 of guessWord
  repeat length of badGuesses
    delete 1 of badGuesses
  add a to word
  add p to word
  add p to word
  add l to word
  add e to word
  repeat length of word
    add _ to guessWord
  repeat until guessesRemaining = 0 or guessWord = word
    ask Enter a letter and wait
    if not guessWord contains answer
      if word contains answer
        set itr to 1
        repeat length of guessWord
          if item itr of word = answer
            replace item itr of guessWord with answer
            change itr by 1
          else
            if not badGuesses contains answer
              add answer to badGuesses
              change guessesRemaining by -1
        if guessesRemaining = 0
          say You lose for 2 secs
        else
          say You win for 2 secs
```

We will give the user 6 guesses

These simply clear out the lists

set the word

set the guess list to underscores

Check to see if we haven't already guessed the letter we entered

If the word contains the letter we entered, then we want to do something

iterate through the list until you find where the character is in the word list and then replace that character in the guessWord list

Otherwise we want to add the letter to the bad guesses and decrement the remaining guesses

i.e if guessesRemaining = 0 that means we must have lost, otherwise we have won

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