

12 Days of Computing



'Tis the season! To mark the festive period, this December we're bringing you wintery activities for the Twelve Days of ... Computing! Never run out of fun things to do in December with 12 activities that are bound to get your pupils in the Christmas spirit!

"On the first Day of Christmas, my true love gave to me..."

1. "A partridge in a pear tree!"

In Computing, binary trees are a data structure designed for fast look-up and containment checking. In this activity find out how to use binary trees to store owls or why not substitute the owls for some reindeer for a more festive activity!

Activity explained: <https://mommycomputersciencecamp.com/binary-search-tree-with-owls-9f05b035878d>

2. "Two turtle doves!"

Did you know that there was a turtle in Python? The Python turtle allows you to draw simple line drawings using python commands. In this activity you will learn how to draw snowflakes using Python turtle.

Activity explained: <https://projects.raspberrypi.org/en/projects/turtle-snowflakes>

3. “Three French hens!”

The Computational Thinking ~~duck~~ Hen! This activity uses 6 LEGO bricks. The task is simple. Give each person a set of bricks and tell them to build a hen. What do you come up with? Suitable for all age groups, this activity helps cover key computing and computational thinking concepts such as: algorithms and algorithm design, abstraction, evaluation, logical reasoning and many more.

Activity explained: <https://digitalschoolhouse.org.uk/workshops/the-computational-thinking-duck>



4. “Four calling birds!”

One of the issues with Wi-Fi can be interference. Demonstrate this with a simple class game.

Activity explained:

1. Have your class arrange themselves into pairs
2. Ask the students to choose who will be A and who will be B
3. Send all the B's to line up on one side of the room and the A's to line up on the other side. Each original pair should stand opposite each other
4. Give each of the A's a different message on slips of paper that they must convey to their partner by shouting it across the room at the same time as the rest of the A's

The B's should find it difficult to understand the messages being delivered to them due to the 'interference' of the other A's messages. You can demonstrate the concept of different Wi-Fi channels by giving each pair a channel number and then only allowing messages to be communicated with pairs using the same channel. This should be easier as less messages are being sent at the same time and therefore there should be less 'interference'.

5. “Five golden rings!”

In Computing, instructions that are repeated are called loops. In this activity use different types of loops to write a coded version of ‘The 12 days of Christmas’. When your students have the original version working, why not challenge them to write their own version!

Activity explained: <https://www.101computing.net/the-twelve-days-of-christmas/>

6. “Six geese a-laying!”

Computers transfer instructions between RAM and the CPU in order to carry them out. In this activity you can play a game of waddle racing while also learning about the fetch, execute cycle!

Activity explained:

1. At one end of the room lay out blown up balloons to represent instructions in the RAM.
2. Have your students start at the opposite side of the room, one at a time each student should run across the room place a balloon (representing an instruction) between their knees and race to the finish line where they can place their instruction in the CPU without dropping or bursting their balloon on the way.
3. If you have a large group and limited space, the races can be done as relays. You could also have a lolly in each balloon which can be retrieved by bursting the balloon once across the finish line to represent the decoding of the instruction when it is received by the CPU.



7. “Seven swans a-swimming!”

Algorithms are sets of instructions that can be followed in order to complete a task. Have your students follow a simple algorithm to create an origami swan. Why not hang them up in your classroom to create a simple festive display!

Activity explained: <https://neu.org.uk/media/2096/view>

8. “**Eight** maids a-milking!”

Try out our Maids a’ milking spreadsheet modelling activity! Help the farmer to investigate how much milk she can produce or use the spreadsheet model to help students understand constants and variables.

File: [dsh-maids-a-milking.xls](#)

9. “**Nine** ladies dancing!”

Christmas wouldn’t be complete without a little dancing. Why not bring a festive twist to our workshop favourite ‘Just Dance with the Algorithm’ and have your students discover algorithms by learning a festive dance routine!

Activity explained: <https://digitalschoolhouse.org.uk/workshop/just-dance-with-the-algorithm>

Just Dance, Jingle Bells: <https://www.youtube.com/watch?v=pCRalfTynUg>



10. “**Ten** lords a-leaping!”

In Computing, when a program moves from one set of instructions to another this can be called jumping. In this activity, use calls to procedures to make the program ‘jump’ to the correct parts of the Christmas song ‘We Wish you a Merry Christmas’. In the Python and Scratch programs below, the procedures for the first verse and chorus have been completed for you; add the rest of the procedures to complete the song!

File: [dsh-we-wish-you-a-merry-christmas.py](#)

Activity explained: <https://scratch.mit.edu/projects/348286559>

11. “**Eleven** pipers piping!”

In Computing, pipelining is the technique of fetching an instruction whilst the prior one is being decoded and the one before that is being executed. Try this with a Christmas craft activity such as the one below. Give different groups of students’ one step to complete and then put everything together! For example, using the activity below, one group will cut out the green strips, one group will decorate the strips and one group will decorate the card. Once the steps are complete the pieces can be distributed equally, and each student builds their own card.

Activity explained: <https://twitchetts.com/2017/10/3d-paper-christmas-tree.html/>



12. “**Twelve** drummers drumming!”

In this unplugged activity, students will transmit a message to other students, using ASCII or Huffman encoding and a drum!

Activity explained: <https://www.slideshare.net/boukeas/lights-and-drumsenv3>