

STEM in the lab

..... • Inspiring Idaho's future STEM workforce

PAPER PLANE ALGORITHMS



GRADE LEVELS

This activity is appropriate for students in grades K-6.



MISSION

Use an algorithm to make a paper airplane.



VOCABULARY

ALGORITHM: Set of instructions designed to perform a specific task.

COMPUTER PROGRAMMER: Skilled professional who codes, tests, debugs, and maintains computer programs. Computer programmers also conceptualize, design and test logical structures to solve computer issues.

PROGRAM: Collection of instructions that can be executed by a computer to perform a specific task.



MATERIALS

» Several sheets of paper

ABOUT THIS ACTIVITY

Computer programmers at INL use code to tell computers what to do. Programmers write instructions, or code, which the computer then executes. Computer programmers solve real-world problems by creating code that will analyze the problem and provide solutions.

Almost every task we complete during the day requires a set of steps. Whether it is making a peanut butter and jelly sandwich, brushing our teeth, or feeding the dog, there are smaller steps that have to be followed to finish the task. Our brains are so smart that we can complete these steps without even thinking about it. Computers don't have a brain like we do. They have to be told what to do. An **algorithm** is the thinking behind what needs to happen. Algorithms are essential to computer science. **Computer programmers** then take the step-by-step algorithm and put it together as a program. A **program** is the instructions given to the computer to complete the task.



DIRECTIONS

- 1 Make a list of all the things you did today that involved getting ready for the day. What steps did it take to get dressed? To brush your teeth? To make your breakfast?
- 2 By following steps, you were able to get ready for the day. You followed an algorithm when you accomplished each of your tasks.
- 3 With a parent's help, use the internet to find steps on how to make a paper airplane. It is important to note that sometimes you can have more than one algorithm (or more than one set of steps) for the same activity.
- 4 Write down the steps for making a paper airplane on a piece of paper. As you write your steps, think about the order that you are writing them in. Is it important to follow a specific order when making a paper airplane?
- 5 Using the steps that you wrote down, make a paper airplane.
- 6 Give your airplane a toss. How far did it fly? Did it fly straight? After a couple of tosses, is there any step that you would do differently? Would you add any steps to the directions?
- 7 Imagine trying to make a paper airplane without a list of steps to follow. Could you do it? What if one or two of the steps were left out?

FURTHER EXPLORATIONS

- » Complete more "unplugged" computer science activities:
<https://inl.gov/inl-initiatives/partnering-with-inl/k-12-stem/resource-library/>
- » Find origami patterns and follow the steps to complete a project.
- » Write your own paper airplane instructions and give them to a family member to complete.
- » Try to make your plane do loops or fly faster by adding different folds.

RESOURCES

- » **Code.org CS Curricula**
<https://curriculum.code.org/>
- » **Any websites on how to make paper airplanes**

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For information on grants, training and student opportunities, curriculum ideas, and other resources, please visit ***stem.inl.gov***.