**Unit 5 - Activity 4**

**Air Resistance Simulation**

In this activity you will create a simulation to replicate your experimental results from Lab 3. This will be the first time you have simulated motion with a non-constant acceleration, so you will need to write an additional function to calculate the acceleration of the coffee filter each tick.

1. Draw a 3-frame flipbook of the coffee filter falling in the space below. Then, underneath each frame, draw the force diagram showing all of the forces acting on the coffee filter at that moment in time.

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| **Flipbook** |  |  |
| **Force Diagrams** |  |  |

1. Using the force diagrams you drew above, write a mathematical expression for the sum of the forces acting on the coffee filter at any moment in time. If this were a computer function, what inputs would it need to take?
2. Complete a design recipe for the function find-a which will calculate the coffee filter’s acceleration at each tick. Write the final function body in the space below.
3. Once your teacher has approved your design recipe, open the code found here: <https://tinyurl.com/ych27xjq>. Use the numbers (mass and slope) from Lab 3 to finish the simulation.
4. Compare the graphs produced by the simulation to those you found in lab. How well does your simulation match what you observed?