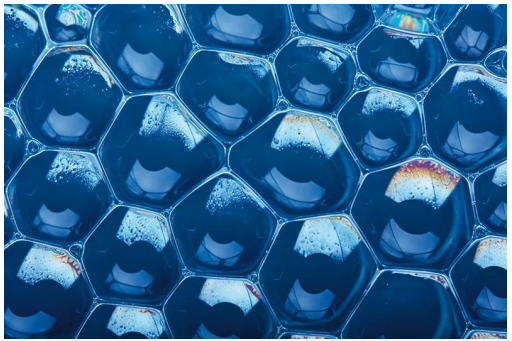
Harry Potter patterns!

Using pattern matching to find out what sort of character you'd be in Harry Potter.

Patterns are everywhere

You might have noticed in your life that a lot of things follow patterns, they're in everything we say, they're all throughout nature, they're even in a lot of the code you've been writing today. It's pretty easy for us humans to recognize patterns. But how does a computer??



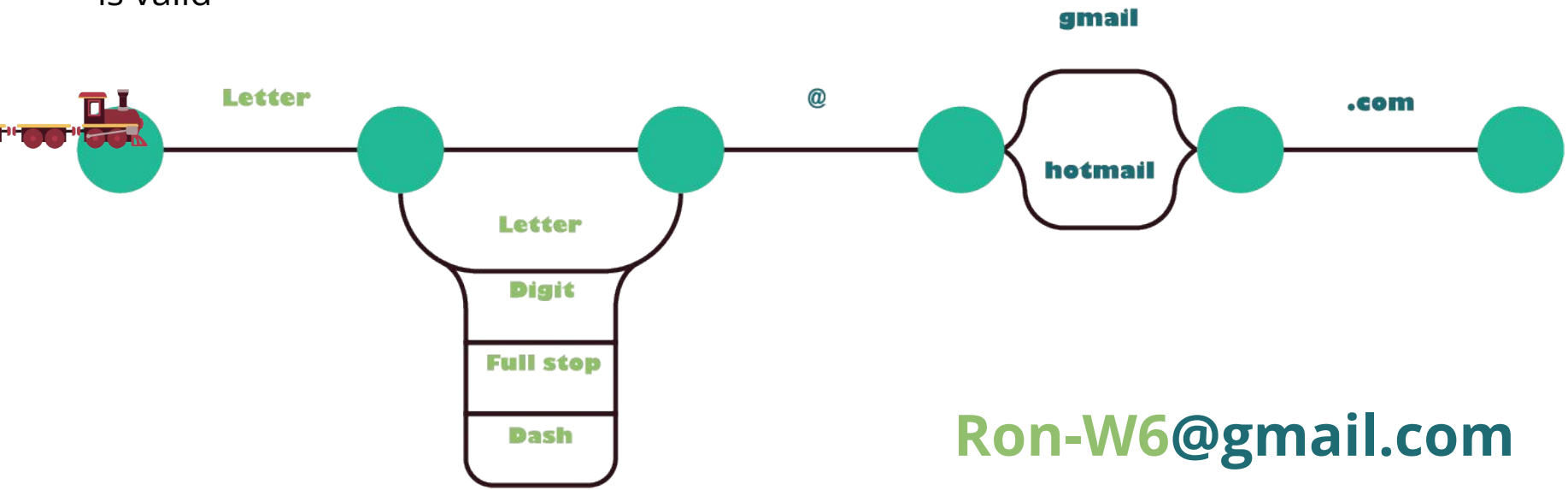
Finite state automata

One of the ways computers test if a bit of text follows a pattern is “Finite state automata”. Here is a visual representation of how the computer evaluates a string to see if it fits the pattern.

The circles are called “nodes” and every time the computer gets to one, it checks whether the next character fulfils the condition of any of the lines leaving the node. Once it reaches the end the string passes!

Pattern checking

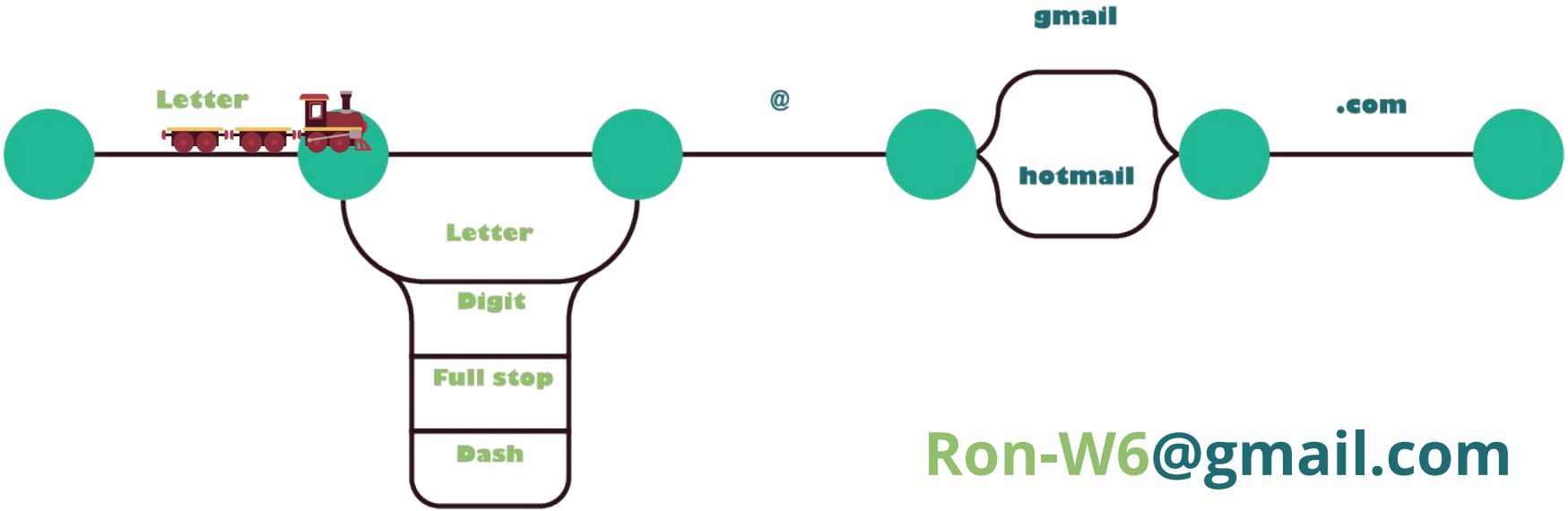
We’re going to imagine the computer is a train, the lines are tracks, and the nodes are stations. We’re going to use this diagram to test if the email **Ron-W6@gmail.com** is valid



Ron-W6@gmail.com

Pattern checking

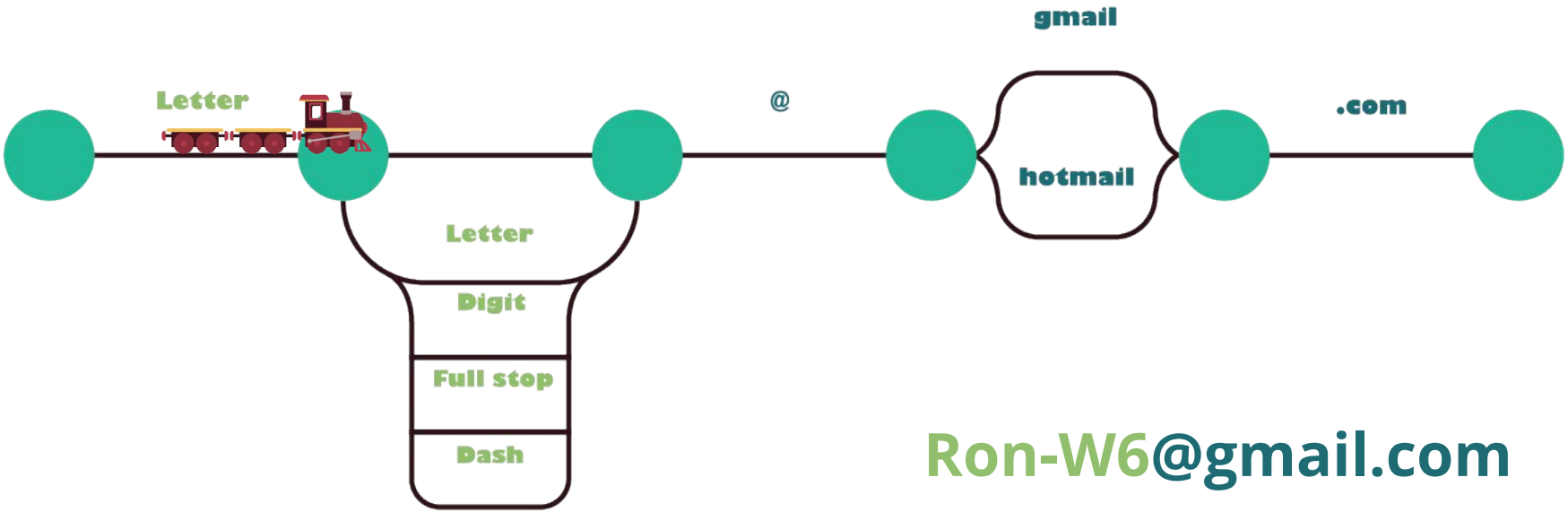
The first character in our email is **R**, since this is a letter our train can move along to the next station



Ron-W6@gmail.com

Pattern checking

There is no condition for the next station so the train moves forward...



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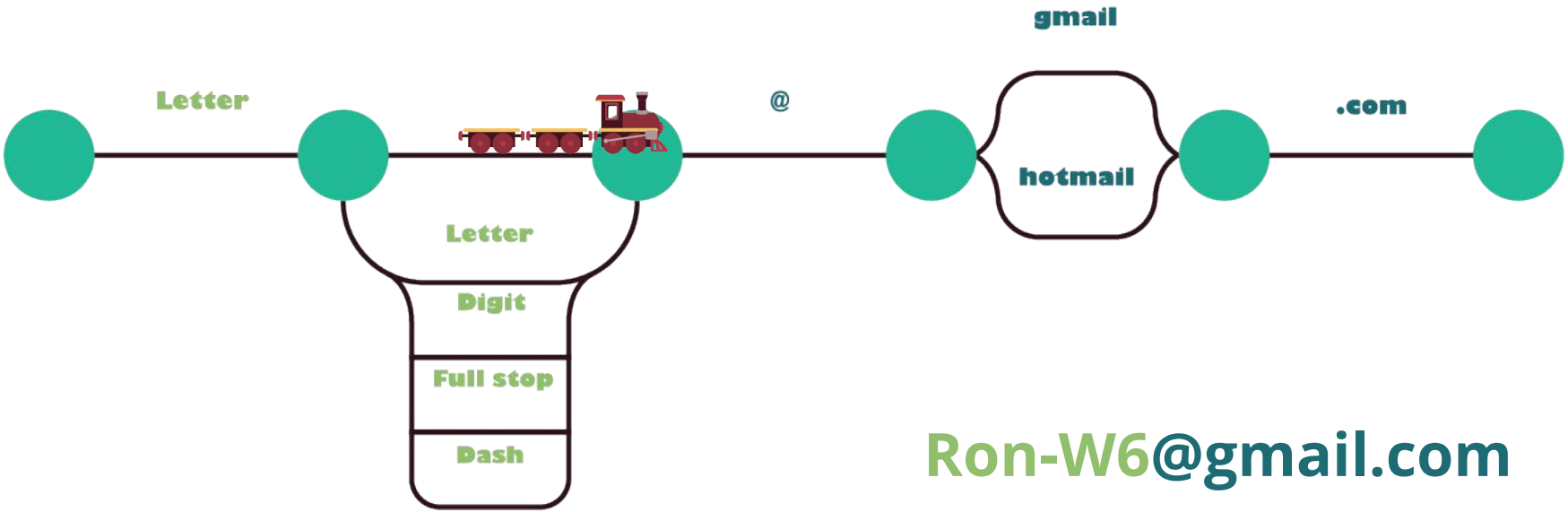
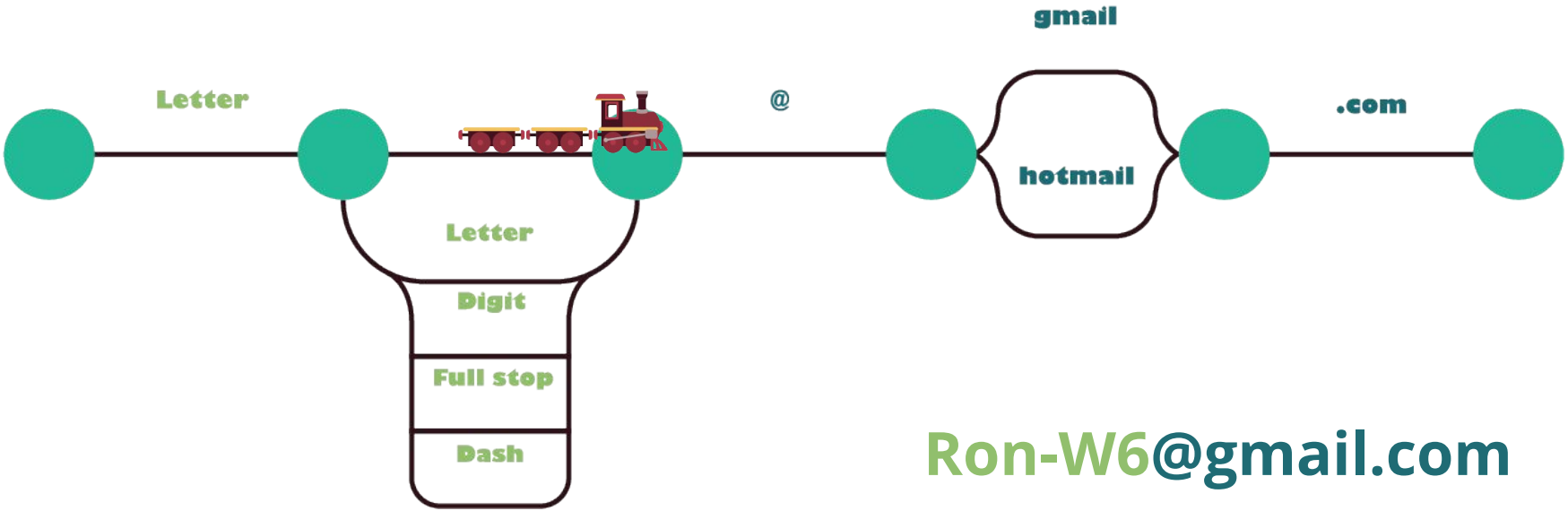


Ron-W6@gmail.com

Pattern checking

Now the next character in our email is an **o**. Since this is a letter, the train needs to follow the “Letter” tracks back to the previous station



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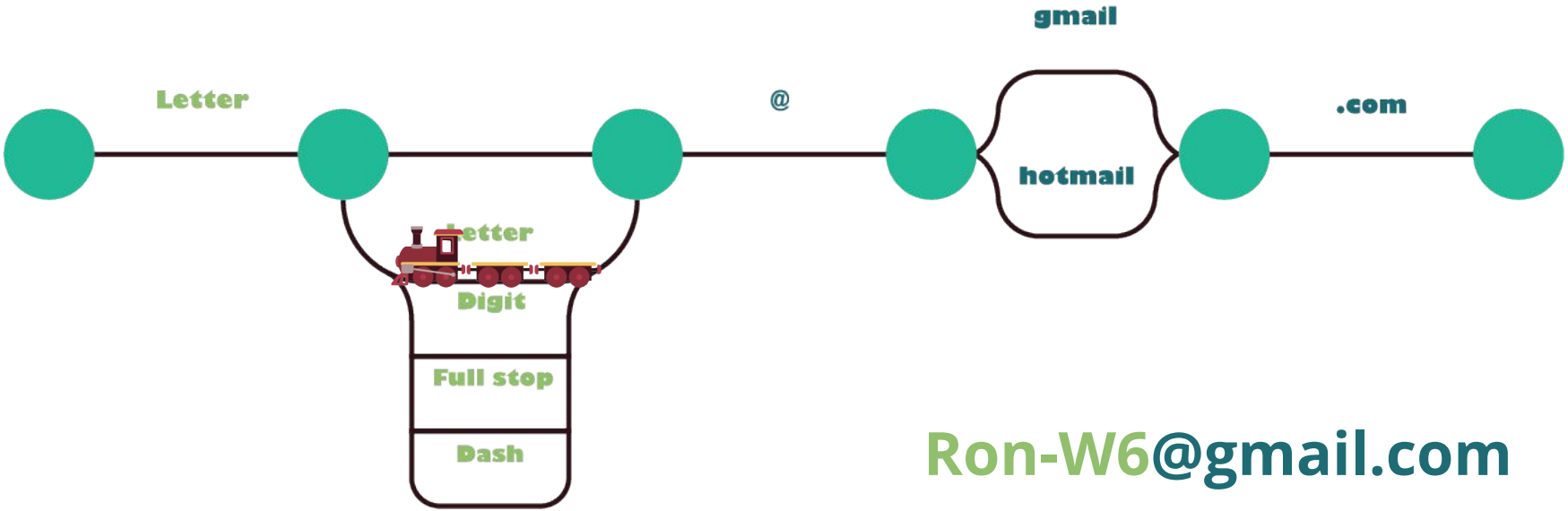

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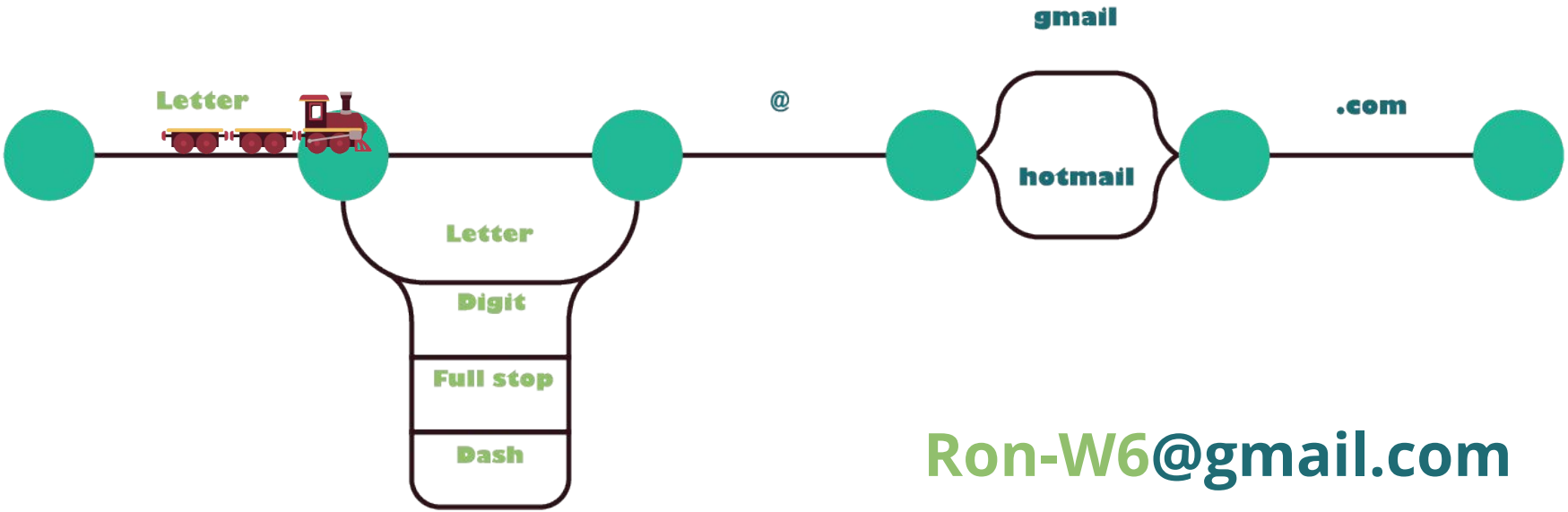
Pattern checking

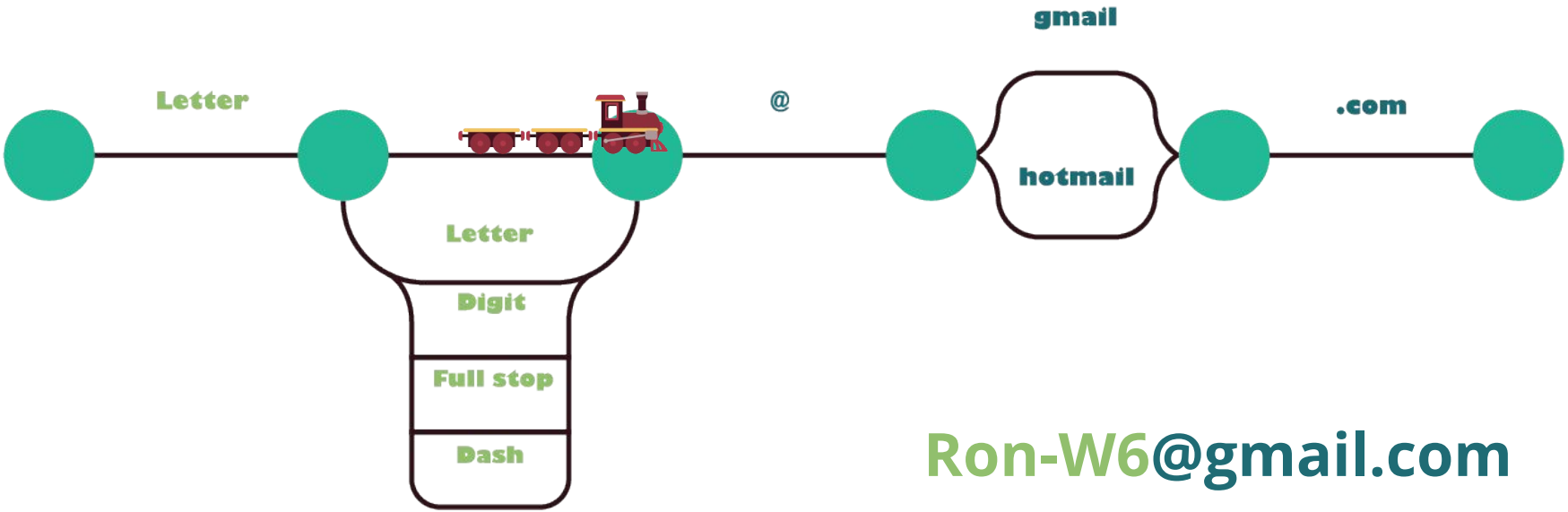
It can then move forward again



Ron-W6@gmail.com

Pattern checking

The next character is **n** so it has to go back again.



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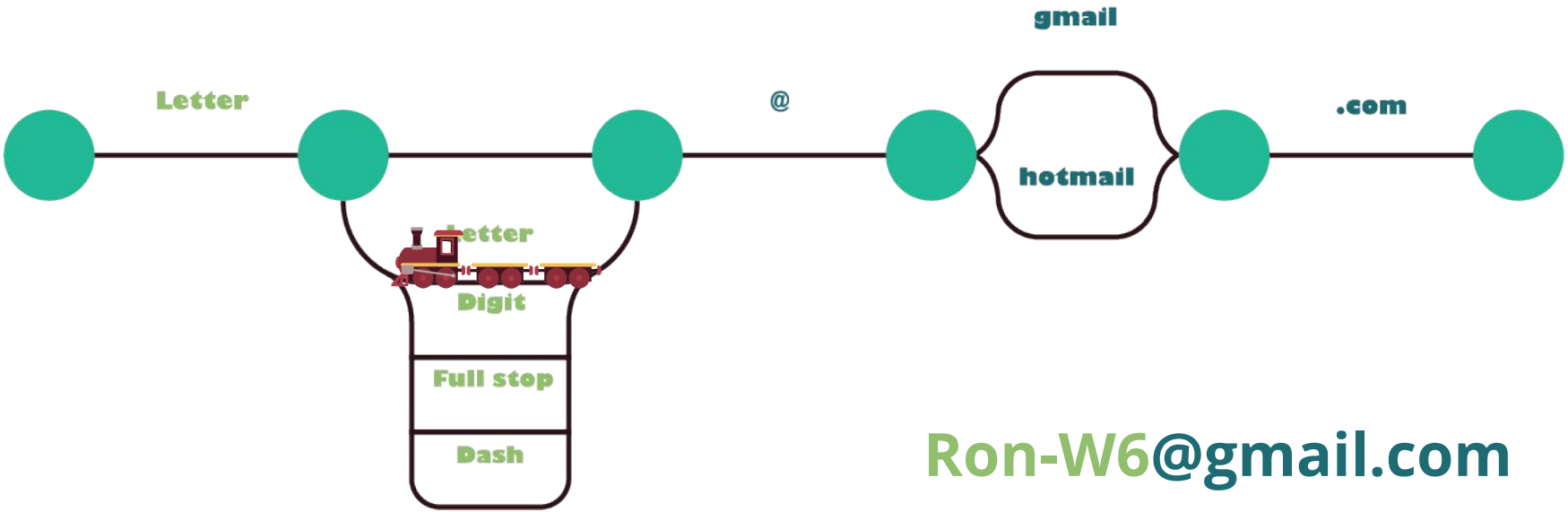

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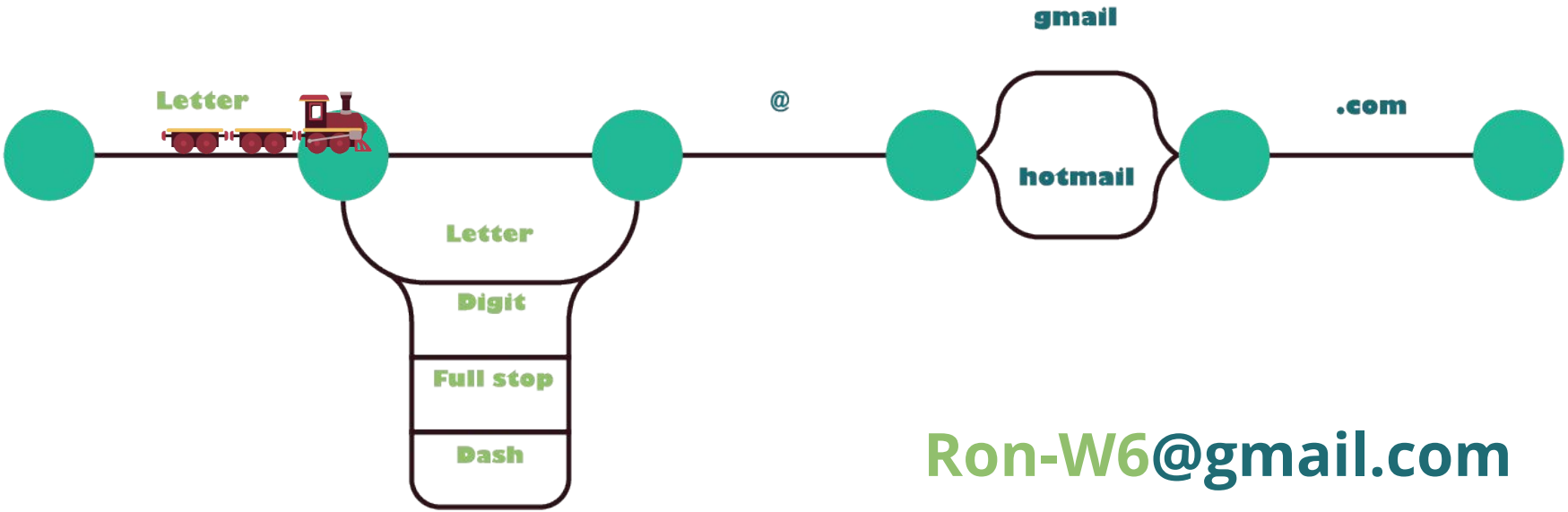
Pattern checking

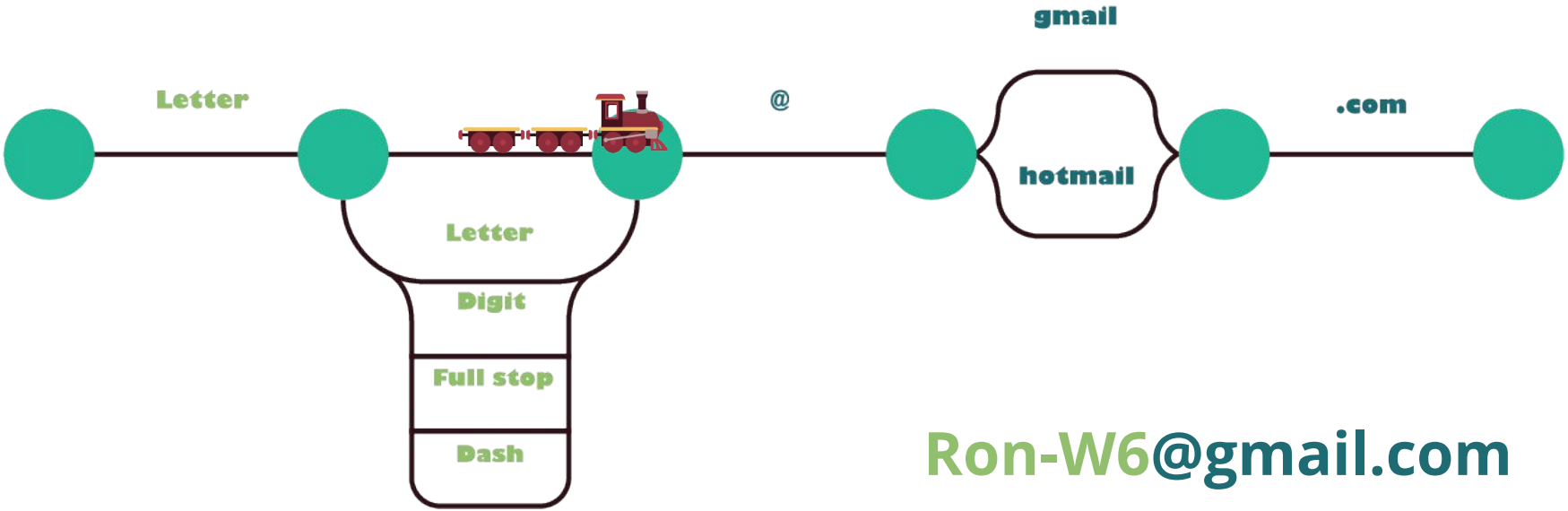
...again it moves forward



Ron-W6@gmail.com

Pattern checking

Now, the next character is a dash (**-**) so it still has to move backwards, just following the “Dash” tracks



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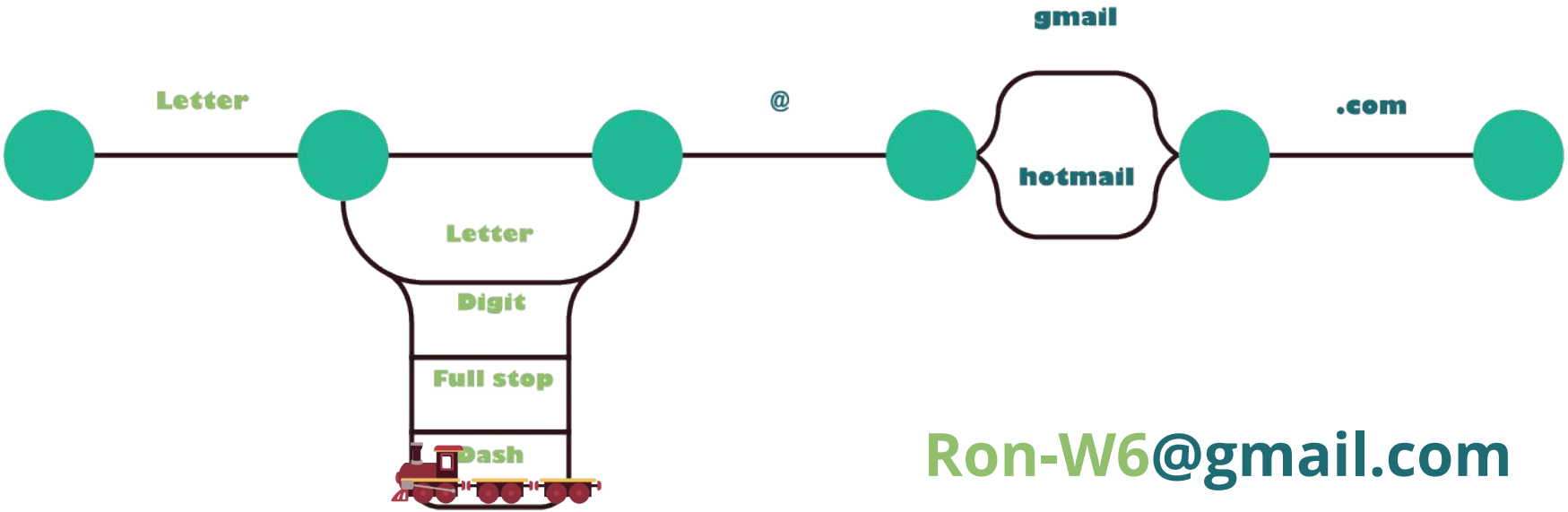
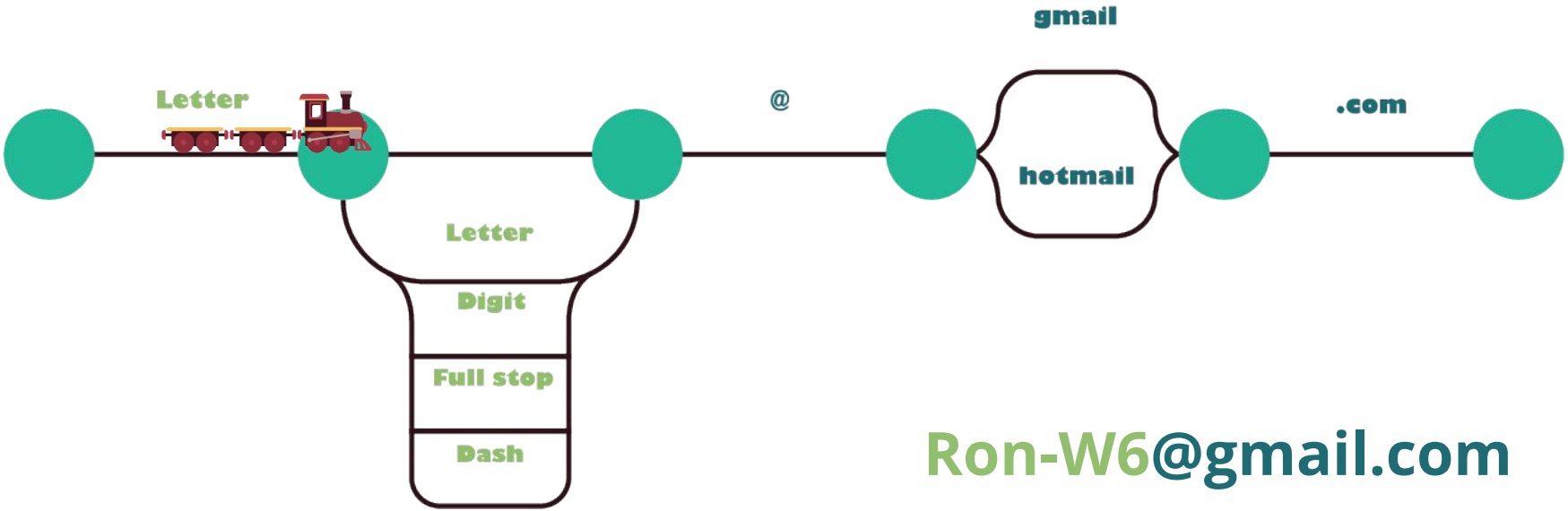


Ron-W6@gmail.com

Pattern checking

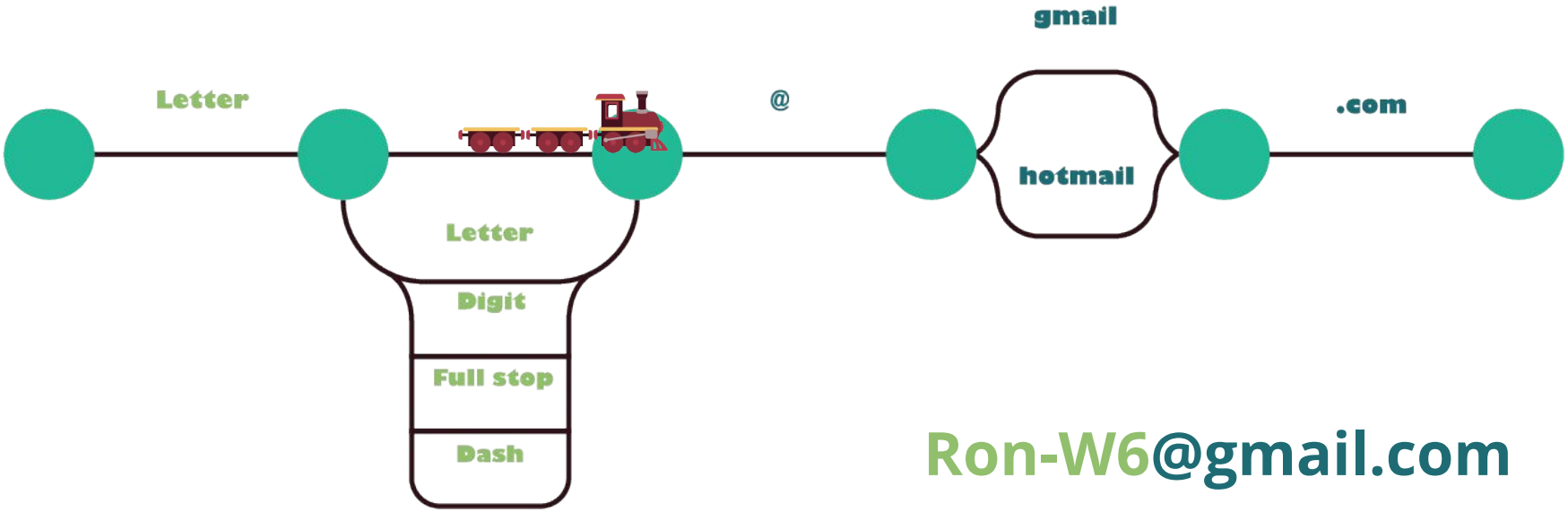
The next couple characters are **W** and **6**, the train will need to do the same thing, following the letter and then digit lines. We're going to skip ahead until after that.



Ron-W6@gmail.com

Pattern checking

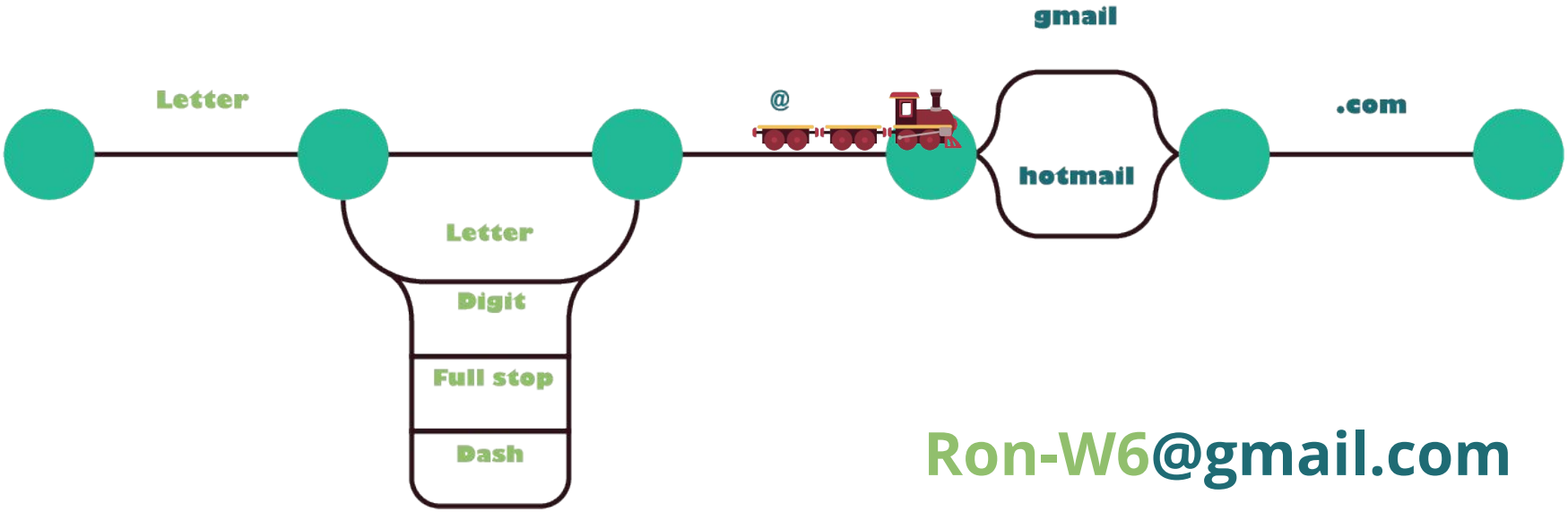
After the **“Ron-W6”** section of the email there is an at symbol (**@**) so the train can go ahead



Ron-W6@gmail.com

Pattern checking

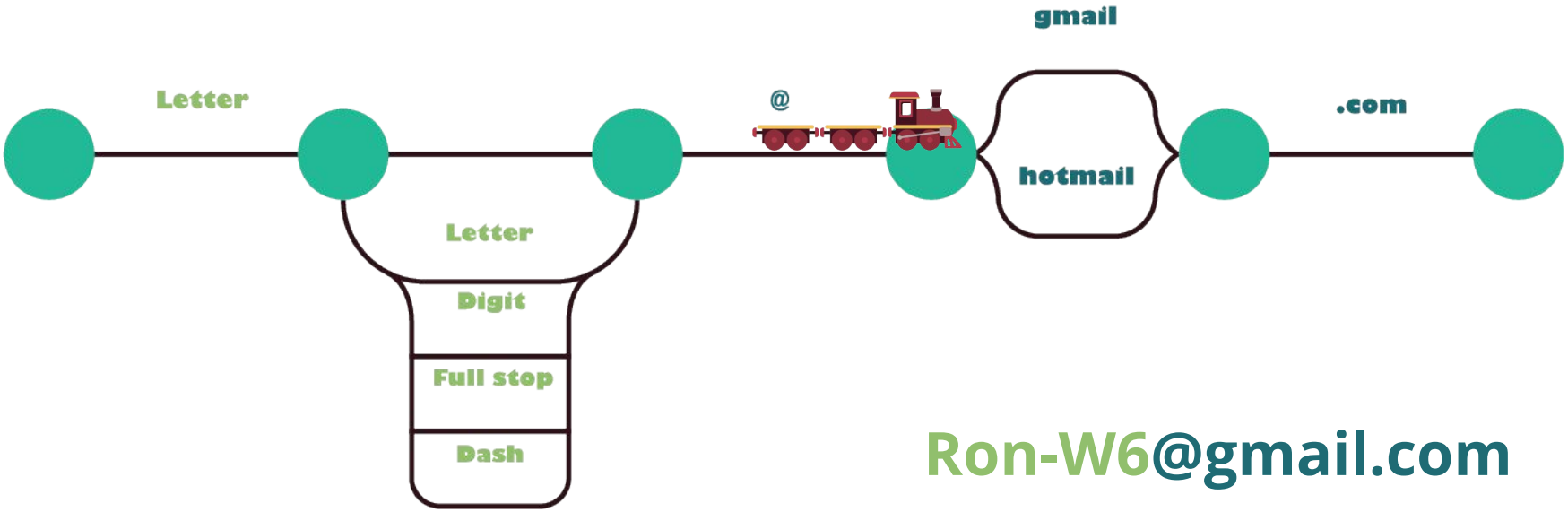
After the **“Ron-W6”** section of the email there is an at symbol (**@**) so the train can go ahead



Ron-W6@gmail.com

Pattern checking

Our example is a gmail so the train can move ahead along the gmail line.



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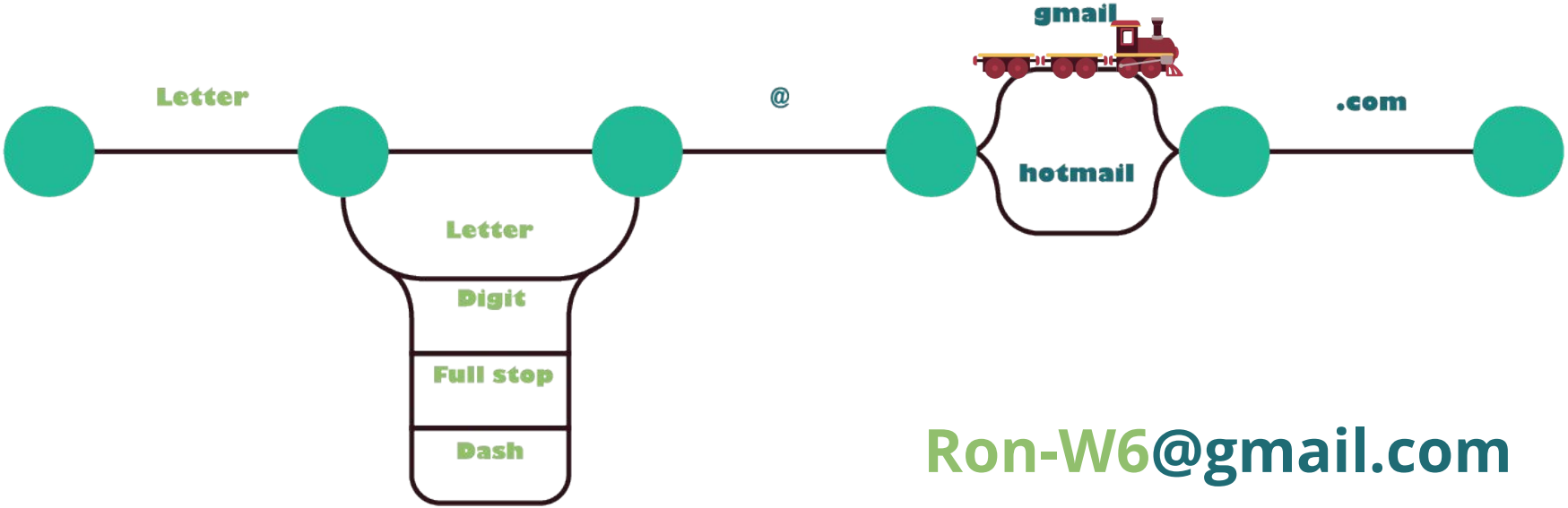
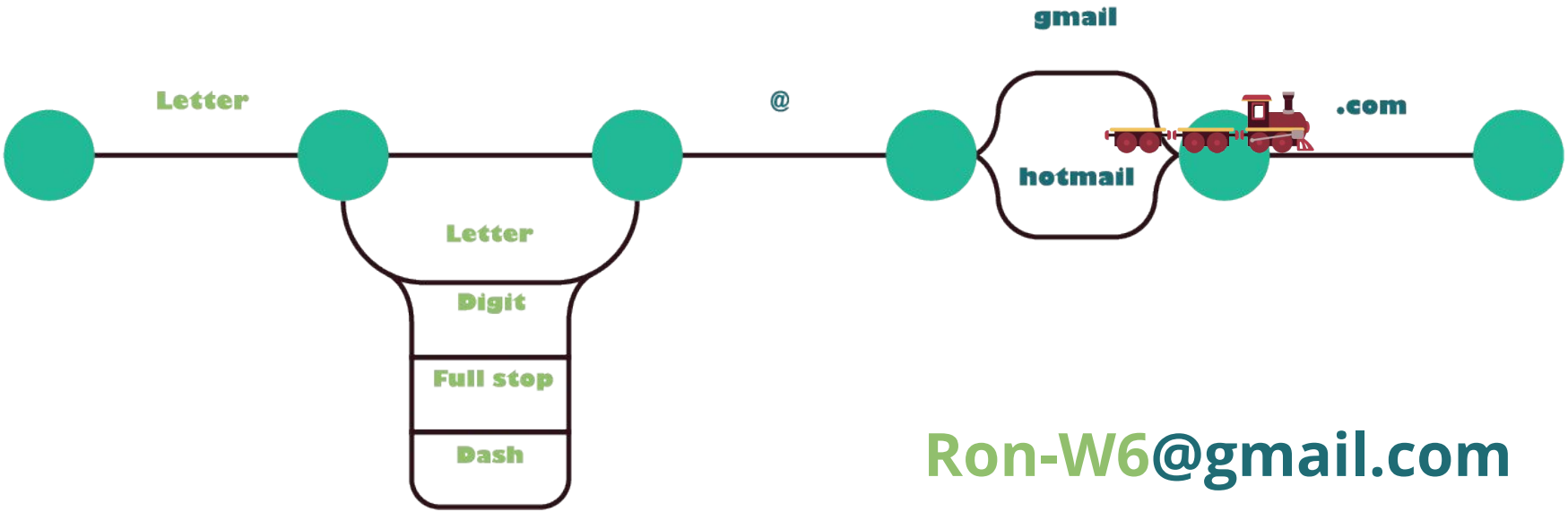


Ron-W6@gmail.com

Pattern checking

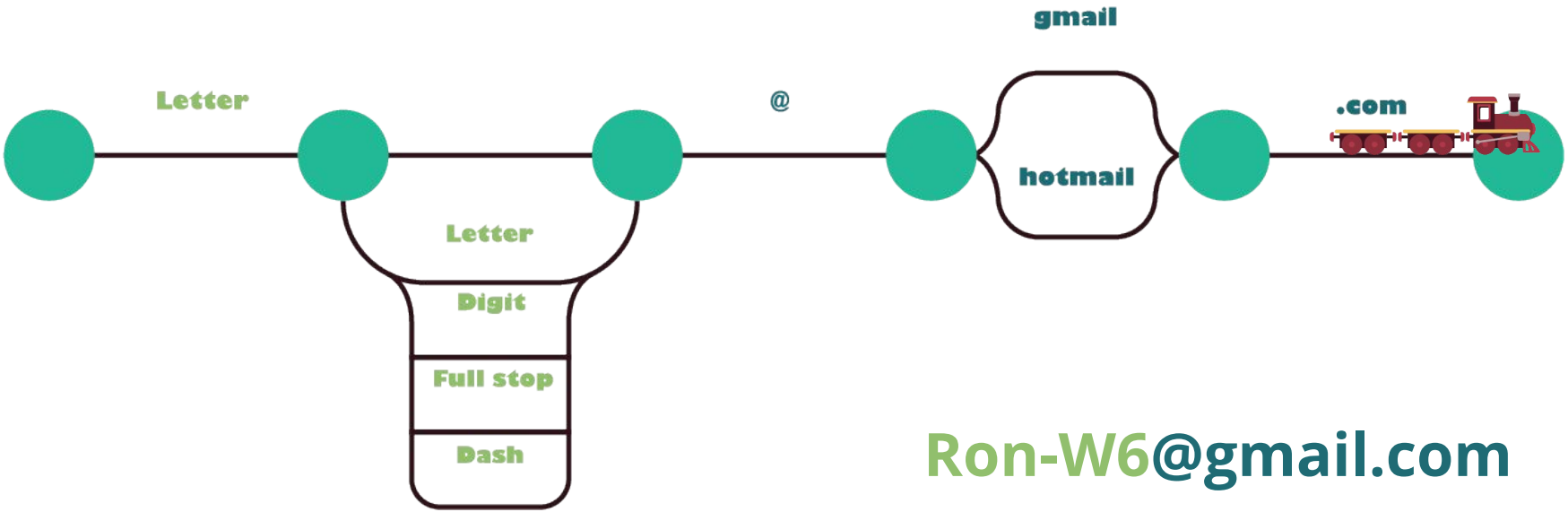
Now the final bit of the email is **.com** so ahead the train goes



Ron-W6@gmail.com

Pattern checking

The train has reached the end! This means our example email was valid.



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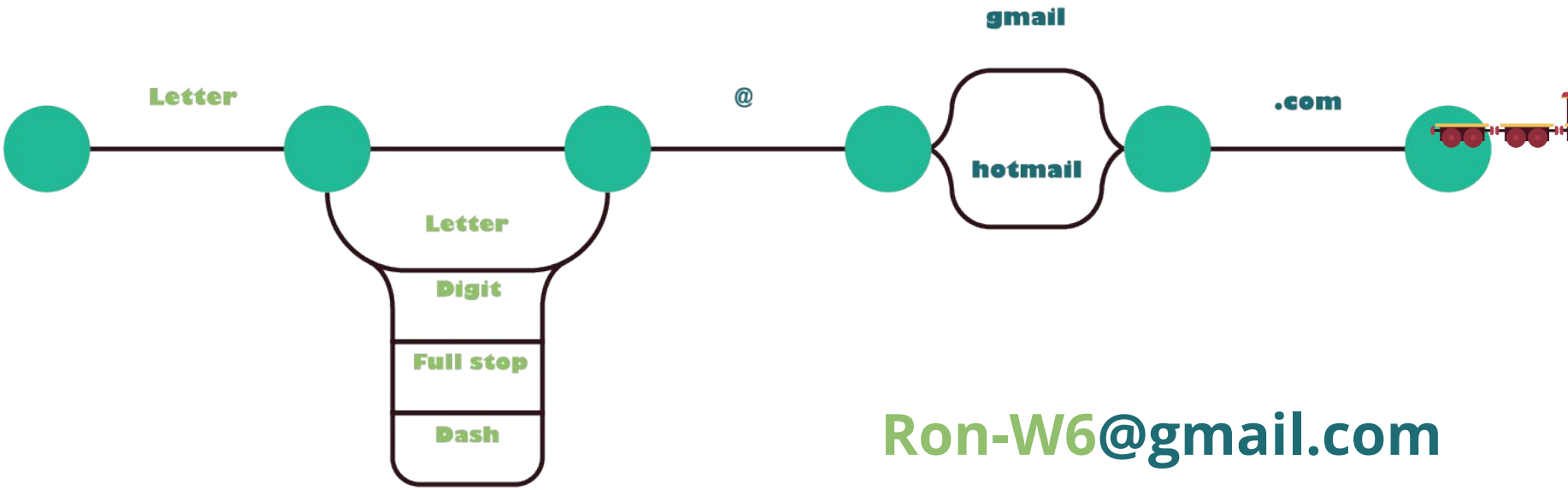

Ron-W6@gmail.com

The game

You are stuck in a labyrinth of chambers in the Harry Potter universe, armed only with a piece of paper with a sentence on it, a pen, and your knowledge of pattern matching.

Follow the clues on the chamber walls to navigate the labyrinth and uncover its secrets

There are three labyrinths - can you solve and map them all?

How to play

1) Go to the tutors at the front to receive a pen, and a piece of paper with a sentence on it. The tutor will then point out the starting “chamber” or poster for the sentence you got.

2) Follow the instructions on the posters until you get the answer.

3) Return to a tutor to have your answer marked. They will then send you on your next mission!