

# THE SCIENCE BEHIND

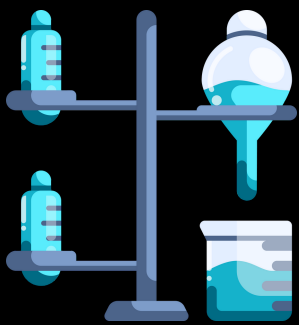
## THE CHAMELEON WITH A SWORD

A TITANFOLIO EDUCATIONAL INFOGRAPHIC



### DID YOU KNOW?

The world of *The Chameleon with a Sword* (TCWAS) is influenced by scientific concepts? Read on to learn about some of the **forms of science** behind the book!



### ENERGY

Energy is the power, or capacity, to do work (i.e., move an object). Energy comes in two types (kinetic and potential), many forms (electric, chemical, etc.), and can be transferred from one form to another.



The Oculan is the TCWAS world's original **energy** source with both positive (Durah) and negative (Noxim) forms.



Both Leena and Mordecai possess and wield Oculaic energy, primarily as **electrical or electromagnetic energy**.



Although TCWAS takes place in a fictional world, certain real world rules, such as the first **law of thermodynamics**, are used (i.e., "Energy can't be created or destroyed.").

### THERMAL RADIATION

Thermal radiation is electromagnetic radiation emitted from an object due to the heat of that object. Thermal radiation can come in a range of forms, including ultraviolet, infrared and visible light.



While Leena, the Nox and the Durah exhibit traits of **luminescence** (the emission of light not from heating), their warm-bloodedness and ability to overheat (Durah) better supports traits of **thermal radiation**. Early in TCWAS, Leena wears gloves to control the energy she emits, which electrocutes whatever she touches.



When Leena absorbs the electricity in the bandits' jail, she demonstrates a form of "**Black-body radiation**," where a body absorbs all incidental electromagnetic (thermal) radiation.

### QUORUM SENSING

Quorum sensing is a complex regulatory communication mechanism in bacteria that allows for the coordination and control of specific group actions, such as the regulation of gene expression, bioluminescence and virulence.



**Quorum sensing** (QS) is the foundation underpinning the relationship the Duro and Nox have with the Oculan. Duro/Nox can link with each other to communicate important information, organize to prevent the Durah/Noxim from becoming unstable, and coordinate to protect or defend the Oculan from external threats.



In QS, bacteria produce chemical signals to identify fluctuations in cell density and allow the bacteria to determine whether to continue or cease certain actions (i.e., stop making proteins). In TCWAS, a warning system produces and sends out a signal (based on energy threshold levels) to Nox and Duro to remove the Oculan from danger. When Leena unknowingly sends out a signal after the car accident and is located and resuscitated by Nox, that is an example of QS's influence within the TCWAS world.

