Critical Work Function: Provide routine facility support

Key Activity: Monitor, maintain, and troubleshoot/repair equipment

Title: Troubleshooting equipment

Assessment:

Students should be comfortable troubleshooting equipment that is not working properly. When asked why a piece of electrical equipment may not be working, students should demonstrate knowledge of the following reasons:

- The equipment is not turned on.
- The equipment is not plugged in.
- A fuse associated with the equipment or with the circuit to which the equipment is plugged in has been blown or a circuit breaker has flipped.
- A wire is frayed.

If none of the above reasons explain why a piece of equipment is not working, students should be comfortable accessing a user's manual to further troubleshoot.

An example of how students may be assessed on their ability to access and use equipment user's manuals is provided below. You can devise any number of questions based on the troubleshooting section of a user's manual for any piece of equipment.

Example assessment question:

You will require the use of the following bacterial incubator at 37°C overnight:



You turn on the incubator, set the temperature, and give it one hour to equilibrate. After one

[Pick the date]

hour you discover that the incubator's temperature is at 40°C. What may be causing the elevated temperature? What do you do?

Answer:

The incubator pictured is a Heratherm Advanced Protocol Microbial Incubator from Thermo Scientific. The instruction manual for this incubator can be found here: http://www.thermoscientific.com/content/tfs/en/product/heratherm-advanced-protocol-microbiological-incubators.html

Table 12-1 lists the error codes for this incubator and possible solutions. "Temperature Too High" suggests that the temperature is too high because a hot object has been placed inside the incubator; this object should be removed. The user should ensure that at least one perforated shelf is being used. After allowing the door to remain open for no more than ten minutes, if the problem persists then the incubator will need to be serviced.

Alternatively, students could be asked to provide information based on Error Codes which would require them to access information like that in Table 12-1 for the Heratherm Incubator.

Resources for teaching:

- Seidman, L.A., and C.J. Moore. 2009. <u>Basic Laboratory Methods for Biotechnology</u> Pearson Education, Inc., San Francisco, CA.
- Seidman, L.A., M.E. Kraus, D.L. Brandner, J. Mowery. 2011. <u>Laboratory Manual for</u> <u>Biotechnology and Laboratory Science</u> Pearson Education, Inc., San Francisco, CA.



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