Marvelous Meaningful Monthly Math

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Education and Training
January

Career – Alarm Technician

Math Activity

"In order to pass the training and get a job, alarm technicians have to have fairly proficient math skills," says Henry Becker. He is an alarm technician.

The term alarm technician implies that a lot of technical know-how comes into play out in the field. Playing with electrical currents requires a good knowledge of the nature of voltage -- how to calculate it and control it. Because alarm work is considered low voltage, it doesn't carry the same dangers and complexities as high-voltage electrician work. But it still calls on a hard-working brain.

Much of an alarm technician's math links problem solving with decision making. "If it's a repair situation that requires problem solving, they have to figure out to what extent the equipment is at fault, by testing and analyzing it and deciding am I going to repair this product or am I going to replace it?" says Becker.

Math helps an alarm technician fit buildings with the right wires and rig devices with the right power. Alarm installation requires knowledge of the relationship between wire footage and electricity as measured in volts.

Power is lost as it runs its course through the wire, a phenomenon called "voltage drop." Technicians have to compensate for the drop by supplying enough volts at the source so that enough makes it to the device.

You're an alarm technician installing a closed-circuit TV monitor in an art gallery space. The fixed power source in the room gives off 12 volts of electricity. The area needed to be monitored starts 12 feet from the source and extends to 36 feet from it.

Camera placement should be in the middle of that zone. Approximately 1.5 volts is lost for every 6 feet it travels from the source. The camera requires a feed of at least 6 volts to operate with a clear picture.

Calculate how much power makes it to the camera from the source. Is it enough? Use your answer to decide whether or not you should move the camera closer to the power source. Base your decision on the following criteria:

1. If you move the camera, you will have to install a second camera to help the first camera fully sweep the zone.
2. The addition of a second camera would decrease power to both cameras by about a third.
3. The second camera would have to be close enough to the power source to operate, but 10 feet from the first camera to help it sweep the zone.
4. If you can leave the first camera, it could sweep the whole zone alone. Compare your calculations from both scenarios to decide what works best.

Name _____ School _____ Teacher _____