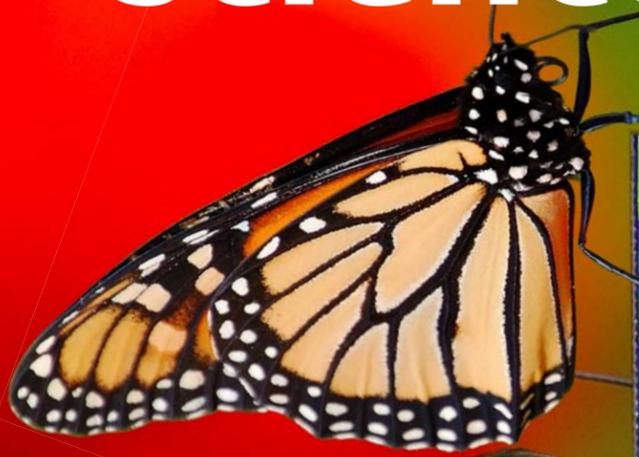


# What's your science fair project?



## Magic Monarchs

### Abstract

This project tries to discover whether reduced exposure to light causes a change in the length of time it takes for a monarch butterfly to go through the pupal stage of its metamorphosis. Monarch chrysalises have gold dots on them, and the function of these dots is still not known. One theory is that they are sensors for light. If this is correct, then exposure to light may have an effect on monarch pupae. I hypothesized that whether they are exposed to light or not, it would have no effect on the length of time that monarch caterpillars pupate. To test this, I collected monarch butterfly eggs locally during the summer of 2015 by looking in local parks for milkweed patches. I took the eggs home and when they hatched, I raised them through the larval stage (caterpillar). In total I had ten caterpillars. As each one formed its chrysalis, I placed it into either "regular light" or "light-deprived" conditions. I had one cage with regular exposure to light and one cage that was covered in a thin dark sheet to block out light, but which would still allow air flow. I measured the amount of time it took for the adult butterflies to emerge and found that those butterflies that were deprived of light seemed to spend a greater amount of time in the pupal stage.

### How Light Deprivation Affects Duration of the Pupal Stage in Monarch Butterflies

### Question

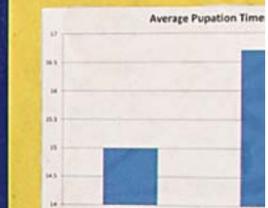
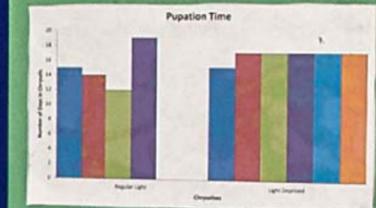
How does light deprivation affect the length of the pupal stage in monarch butterflies?

### Hypothesis

Light deprivation will not have an effect on the length of the pupal stage in monarch butterflies.

### Procedure

1. I collected monarch butterfly eggs locally during the summer of 2015.
2. I raised them as caterpillars in a mesh cage or plastic cage with air holes. I supplied them regularly with locally gathered milkweed. I checked on them daily until they formed their chrysalis.
3. When each chrysalis was formed, I assigned each one a number and took note of the date they entered the pupal stage.
4. On that date, I placed the chrysalis into either regular indoor light conditions, or light deprived conditions. The light deprived chrysalises were kept with a sheet covering the mesh cage. Both regular light and light-deprived cages were kept in the same area so they experienced the same temperature and humidity. This was how I controlled the other variables in the experiment.
5. I checked daily on the cages and noted the date that any butterfly emerged. I calculated the duration of the pupal stage for each emerged butterfly. I calculated the duration of the pupal stage for each emerged butterfly. The butterflies were released outside on the same day I had emerged.



## Magic Monarchs

How light deprivation affects duration of the pupal stage in monarch butterflies

Delia McKenzie Jansen

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