# Differences in various candy melting points

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**Introduction**
For this science experiment, my group wondered if different candies have different melting points. My hypothesis was that if a candy had chocolate in it, it would melt at a lower temperature than non-chocolate candy. We decided to test three brands of chocolate candy: M & Ms, Hershey's kisses and Crunch bars. We tested Skittles as our control, because skittles do not have any chocolate in them, but are made of made of other similar ingredients to the other three candies.

**Methods:**
The materials we used were:

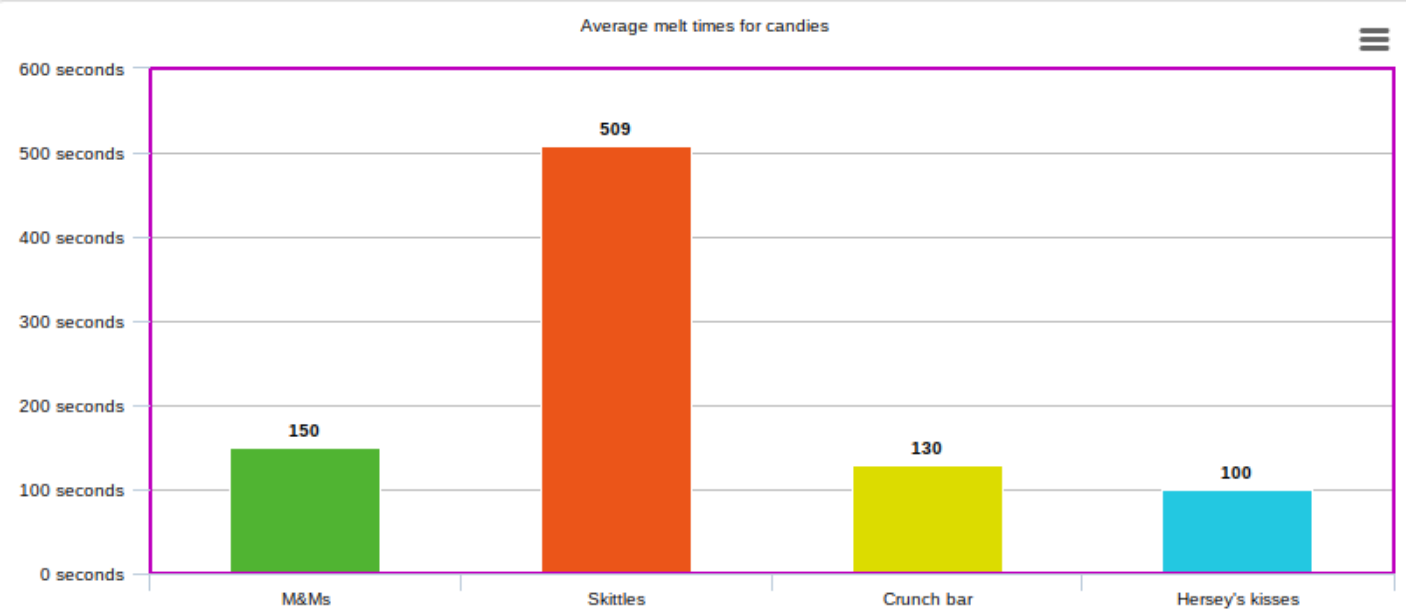
1. An electric hot plate
2. Small metal baking tray
3. M & Ms, Skittles, Crunch bars, Hersey's kisses
4. Timer

For our procedure, we measured out 10g of each candy so that the mass of the candy would be a constant. We started by placing 10g of M & Ms on the baking tray and then started the timer as soon as we put the tray on the hot plate. The hot plate was turned up to 200 degrees. We waited until the M & M appeared to melt, and then recorded how long that took in our data table. We washed the baking tray off, let it cool down back to room temperature, and then repeated this process for Skittles, Crunch bars and Hersey's kisses. After we tested all the candies 1 time, we repeated that whole process 4 more times, for a total of 5 trials for each piece of candy.

**Data:**
The table below shows our data analysis:

| | **M & Ms** | **Skittles** | **Crunch bar** | **Kisses** |
|---|---|---|---|---|
| **Average melt time (s)** | 150 | 509 | 130 | 100 |

Our results are displayed in the bar graph below:




**ANALYSIS**

Hersey's kisses melted the quickest of any of the candies, followed by Crunch bars and then M&Ms. The average melt time for skittles was significantly higher than it was for any of the candies with chocolate. Below is a table of candy types and their ingredients:

**Ingredients list of candies tested**

| | |
|---|---|
| **M & Ms** | Milk, cocoa, citric acid, color dyes, corn syrup |
| **Crunch bar** | Milk, cocoa, citric acid, rice, corn syrup |
| **Hersey's kisses** | Milk, cocoa, citric acid, corn syrup |
| **Skittles** | Corn syrup, color dyes, palm oil, citric acid |

**CONCLUSION**

Our hypothesis- which was that chocolate candies would melt faster than non-chocolate candies- was supported by the data from our experiment. After doing some research on ingredients, it is possibly that the fewer ingredients a candy has, the lower the melting point. Milk- a key ingredient in Hersey's kisses- has a melting point of 33 degrees F. That is the lowest melting point of any of the ingredients in the candies, and possibly explains why Hersey's kisses melt the fastest. While Crunch bars and M & Ms also have milk, it is safe to assume since Hersey's kisses have less ingredients than the other two, it is made up of a higher percentage of milk than the other two.

Skittles do not have milk or cocoa in them, and skittles have took the longest by far to melt than any of the other candies. After doing this experiment, we realized it would have been good to compare another non-chocolate candy to the chocolate candies, so that we could make sure the chocolate was the factor that changed melting point. For example, if we had tested Twizzlers in addition to the other 4 candies we tested, and found that Twizzlers had a melt time of less than 150 seconds, that would NOT support our hypothesis that chocolate is the factor that determines a candy's melt time.

Understanding the melt time of candies could be useful to materials engineers, who might be able to use this information to design packages that prevent candy from melting before it is opened.