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# Interpreting Data & Drawing Conclusions

*Scientists interpret the data they collect during scientific investigations and **draw conclusions** based on the interpretation.*

## Interpreting Data

Scientists perform investigations to learn more about something. When an experiment is complete, the scientist studies the **data** to figure out what it means. The scientist tries to understand how one thing in the investigation affects another. For example, imagine a scientist planted 20 bean seeds in each of seven cups. She then exposed the seeds in each of the seven cups to a different temperature. The scientist might get data like the following:

**Sprouting of Bean Seeds at Different Temperatures**

| Temperature (in °F) | Number of Sprouted Bean Seeds |
|---------------------|-------------------------------|
| 55                  | 2                             |
| 60                  | 5                             |
| 65                  | 7                             |
| 70                  | 12                            |
| 75                  | 15                            |
| 80                  | 9                             |
| 85                  | 4                             |

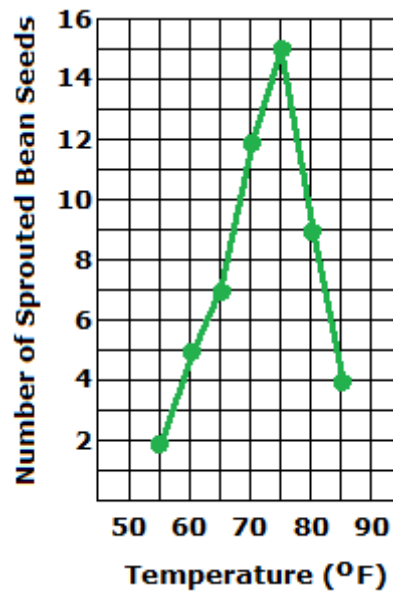
From this data, the investigator could say that more of the bean seeds sprouted at 75 °F than at 55 °F.

## Making Predictions

The analysis of data allows scientists to observe patterns or trends. Once a pattern is found, scientists can make predictions.

For example, in the seed experiment shown above, the following pattern may be observed:

### Germination of Bean Seeds at Different Temperatures



Once the scientist observes this trend, she can predict that fewer than two seeds will sprout at temperatures that are lower than 55 °F and fewer than four seeds will sprout at temperatures that are greater than 85 °F.

## Drawing Conclusions

After gathering and interpreting data, a scientist may draw a conclusion. Conclusions must be supported by evidence, such as data and observations, gathered during the investigation. Conclusions may explain the causes and effects of things that happened during the investigation.

For example, the scientist performing the bean sprouting investigation whose data is shown above may use her data to conclude that temperature affects seed germination, and 75 °F is the best temperature for sprouting bean seeds of this type.

After the scientist draws a conclusion, she should compare the conclusion to the prediction she made before performing the investigation. The comparison may show that the scientist's prediction was supported if the conclusion matches the prediction. The comparison could also show that the prediction was *not* supported. Either way, a well-done experiment or investigation increases scientific knowledge.

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