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| **Scientific Method Magic Numbers** |
| **Directions:**  Put the number of the definition listed below into the square with the correct term. Check your answers by adding the numbers across each row and down each column. The Magic Number is the total that you get each time.  |
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| **Data** | **Hypothesis** | **Independent Variable** |
| **Scientific Method** | **Experiment** | **Theory** |
| **Control** | **Dependent Variable** | **Constant** |

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| **Definitions:** 1. In a controlled experiment, the measurable condition which results from changing the independent variable.
2. In a controlled experiment, the condition that the experimenter purposely changes/manipulates.
3. Common procedures used by scientists to gather information for problem solving and experimentation.
4. Information obtained by observation, particularly during experiments; only considered valid if repeated trials yield similar results.
5. Procedure by which scientists determine the validity of a hypothesis by collecting information under controlled conditions.
6. Conditions in an experiment which are purposely held the same by the experimenter.
7. Results when a hypothesis is repeatedly verified over time and through numerous separate experiments.
8. The part of the experiment which receives no treatment in order to serve as a comparison for the experimental trial groups.
9. Testable explanation of a question or problem (i.e. If\_\_\_\_\_\_\_\_\_, then \_\_\_\_\_\_\_\_).
 |
| **What is the Magic Number?** |
| **Quick Review:** List the 7 steps of the Scientific Method in order**.** 1.
2.
3. **http://www.reallifeanswers.org/images/mormon-scientist.jpg**
4.
5.
6.
7.

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| **Scientific Method Matching Practice** |
| **Directions:** Read the description of the following experiment. Match the part of the scientific method to the correct statement by writing the letter of the correct answer next to the statement it best describes.  |
| Two scientists were interested in discovering the effect of caffeine on heart rate. They believed, after reading about other studies on the effects of caffeine, that caffeine would increase heart rate. Using 100 people, they divided them into two groups of 50 individuals. All of the individuals being tested were females between the ages of 25 and 30. There were instructed to remain in bed for one hour after awakening each morning. One group was served a cup of strong black coffee as soon as they awakened. The other group was served a cup of orange juice. The experiment was repeated four times. Each group received the coffee twice out of the four repeated trials. It was found that the group which received the coffee had an increased heard rate at the end of the hour after awakening. The average increase was 10 beats per minute. Based on these findings, the scientists decided that caffeine does in fact increase heart rate.  |
| **Part of the Scientific Method** | **Statement** | **Correct Answer** |
| 1. **Problem**
 | 100 females, stopwatch, coffee, orange juice, 100 beds |  |
| 1. **Hypothesis**
 | Based on these findings, the scientists decided that caffeine does increase heart rate. |  |
| 1. **Independent Variable**
 | They believed, after reading about other studies on the effects of caffeine, that caffeine would increase heart rate. |  |
| 1. **Dependent Variable**
 | Two scientists were interested in discovering the effect of caffeine on heart rate.  |  |
| 1. **Control**
 | What is the effect of caffeine on heart rate? |  |
| 1. **Materials**
 | Using 100 people, they divided them into two groups of 50 individuals. All of the individuals being tested were females between the ages of 25 and 30. There were instructed to remain in bed for one hour after awakening each morning. One group was served a cup of strong black coffee as soon as they awakened. The other group was served a cup of orange juice. The experiment was repeated four times. Each group received the coffee twice out of the four repeated trials.  |  |
| 1. **Constants**
 | The group that received coffee had an increased heart rate an hour after awakening. The average increase was 10 beats per minute.  |  |
| 1. **Procedure**
 | Caffeine |  |
| 1. **Conclusion**
 | No caffeine |  |
| 1. **Data & Observations**
 | The effect on heart rate |  |
| 1. **Purpose**
 | All females, all between the ages of 25-30, all to remain in bed for one hour after awakening. | **http://citizenactionny.org/wp-content/uploads/2013/05/cup-of-coffee.jpg** |