Mythbusters Science

Season 1, Episode 1
*"Ice Bullet, Exploding Toilet, **Who Gets Wetter**"*

The Myth: If caught in a rainstorm, you will stay drier if by running for shelter, instead of walking.

Experimental Setup: The Mythbusters set up a controlled experiment to compare the amount of rainwater absorbed by walking versus running a set distance.

Background Questions:
(Answer before watching the episode!)

1. Define, in your own words, each of these steps of the scientific method:

    Question –

    Hypothesis –

    Experiment –

    Analysis –

    Conclusion –

2. The question to be answered by this segment of Mythbusters is "Do you get wetter by walking or running in the rain"? Given this question, what hypothesis do you have?

3. Explain why a hypothesis is not just a <u>guess</u>.

4. The Mythbusters have two options: conduct the experiment indoors in controlled conditions, or outdoors in nature. What are the pros and cons of each?

5. What is the **independent variable** to be tested in this experiment?

6. What is the **dependent variable** to be measured in this experiment?

7. A controlled experiment such as this one always has an **experimental group** and a **control group**. What is the difference between the two?

        The control group…

        The experimental group…

Application Questions:
(Answer after watching the episode!)

8. The goal of a controlled experiment is to only alter the variable that is to be tested, leaving all others constant. What variables do the Mythbusters account for in their experimental design? List five.

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9. How was the experiment that the two meteorologists designed different than that of the Mythbusters?

10. Adam and Jamie each did 4 trials: walking without wind, running without wind, walking with wind, and running with wind. Do you think this is enough data? Explain how **sample size** can affect the outcome of an experiment.

11. This is the data table based on the Mythbusters' results. Calculate the amount of water absorbed in each trial, and the water absorbed per second for each trial.
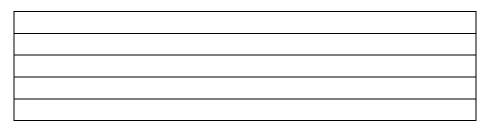
Trial	Wind	Time (s)	Initial Mass of Suit (g)	Final Mass of Suit (g)	Water Absorbed (g)	Water Absorbed Per Second (g/s)
Adam walk	No	18.28	757	785		
Jamie walk	No	17.84	757	790		
Adam run	No	7.06	757	799		
Jamie run	No	6.59	757	793		
Adam walk	Yes	17.40	757	789		
Jamie walk	Yes	17.56	757	788		
Adam run	Yes	6.98	757	801		
Jamie run	Yes	6.51	757	790		

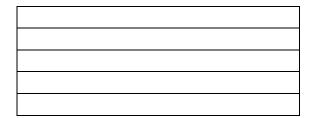12. Calculate the average amount of water absorbed in the running and walking trials:

Avg. Water Absorbed (Running) =

Avg. Water Absorbed (Walking) =

13. Based on the data recorded in the table above, generate a **scatterplot graph**. Mark the walking trials on the graph with an "x", and the running trials with an "o". The independent variable should go on the x-axis, and the dependent variable on the y-axis. Label both axes!

14. Finally, generate a **bar graph** based on the average water absorbed running and walking.

15. Give one advantage and one disadvantage of displaying your data in a scatterplot graph.

16. Give one advantage and one disadvantage of displaying your average data in a bar graph.

17. What conclusion did the Mythbusters make as a result of this experiment? Did their conclusion agree or disagree with that of the two meteorologists? Which do you think is a more accurate conclusion? Explain your choice.

18. **Extra credit!** The Mythbusters redesigned this experiment in Episode 38: Mythbusters Revisited (Found in the Third Season of Mythbusters), and collected different data. Watch this segment and explain how they changed their experimental procedures. Do you feel their data from the second attempt is more or less reliable? Explain why.