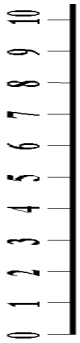
5.8.A.1. Develop an explanation of motion using the relationships among time, distance, velocity, and acceleration

Name _____
Date _____
Period _____

Dance and Acceleration

Learning Goal: I will utilize the elements of dance to calculate and graph acceleration.

Background: Acceleration is the rate at which an object changes its velocity. An object is accelerating if it is changing its velocity. In the last class you created a dance to calculate your speed. You will now use that same dance to calculate and graph the acceleration during your dance.



Procedure:

1. Tape off a total distance of 10 meters.
2. Mark 2 meter increments along the taped line
3. You will complete your dance with someone taking the time at each marked Increment.
4. Complete the data table below to calculate velocity
5. Complete up to 4 trials
6. Create acceleration graph comparing your data with someone else's

Data:

Trial	0m to 2 m	2 m to 4 m	4 m to 6 m	6 m to 8 m	8 m to 10 m
1					
2					
3					
4					
Average time (seconds)					
Average Velocity (m/s)					

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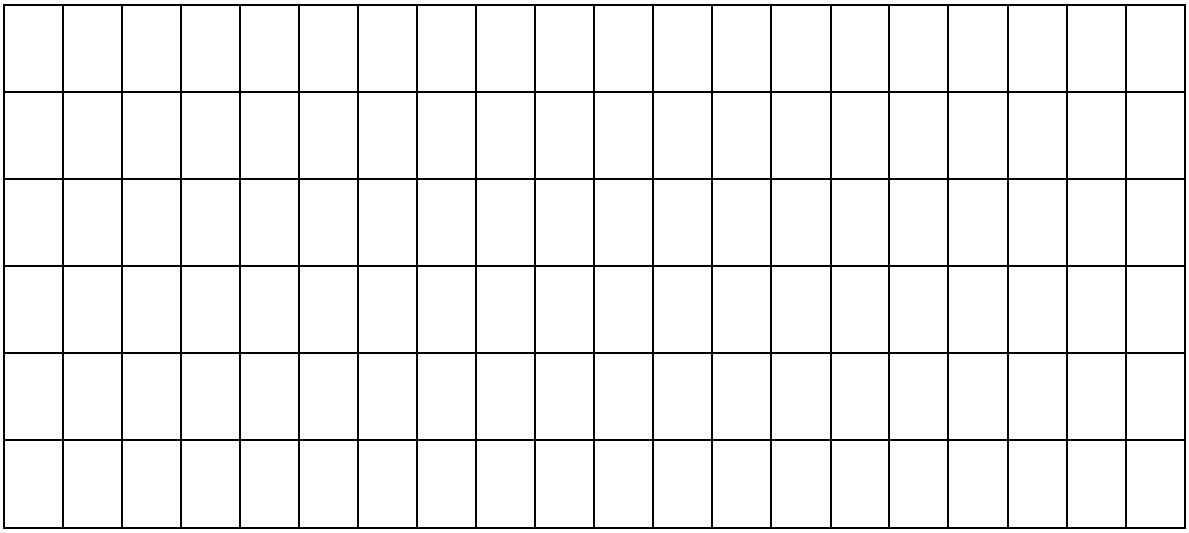
Analysis:

1. **Complete the graph using TAILS**

Dancer 1 2 m_____ 4 m _____6 m _____ 8 m _____ 10m _____

Dancer 2 2 m _____ 4 m _____6 m _____ 8 m _____ 10m_____



Time

1. During which 2 m long interval were you car traveling the fastest on average? _____
2. During which 2 m long interval were you traveling the slowest on average? _____
3. Between 0 m and 6 m, did you have a positive acceleration or negative acceleration? How do you know?

_____

_____

_____

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4. a) Assume your average speed 2 m was its initial velocity, and that the average speed of your cart at 8 m was its final velocity. Calculate the change in velocity of your cart from 2 m to 8 m.

b) Calculate the time it took (use the averages) for you travel from the 2 m line to the 8 m line.

c) Using your answers from parts a) and b) above, and the equation for acceleration, calculate the acceleration of your cart from 2 m to 8 m.

5. What are three possible sources of error in this experiment?

1.

2.

3.

6. In the space below, describe your motion as you danced across the floor

_____

_____

_____

_____

_____

_____