**Unit 2 – Activity 8**

**Velocity-Time Graphs**

Adapted from AMTA 2013

1. This motion map shows the position of an object once every second. From the motion map, answer the following:

**0m**

**2m**

**4m**

**6m**

**8m**

**10m**

a. Describe the motion of the object.

|  |  |
| --- | --- |
| b. Represent the motion with a  quantitative **x** vs. **t** graph. | c. Represent the motion with a  quantitative **v** vs. **t** graph. |

d. Write a mathematical representation for the relationship between position and time.

**position (m)**

**time (s)**

**velocity (m/s)**

**time (s)**

e. From the position-time graph find the displacement from t = 1 s to t = 3 s.

f. Find the area under the velocity-time graph from t = 1 s to t = 3 s. What are the units of this area? What does this area represent?

2. From the position vs. time data below, answer the following questions.

|  |  |
| --- | --- |
| **t (s)** | **x (m)** |
| 0 | 0 |
| 1 | 2 |
| 2 | 4 |
| 3 | 4 |
| 4 | 7 |
| 5 | 10 |
| 6 | 10 |
| 7 | 10 |
| 8 | 5 |
| 9 | 0 |

a. Draw a motion map for the object.

**0m**

1. Construct a graph of position vs. time. c. Construct a graph of velocity vs. time.

**velocity (m/s)**

***t* (s)**

**0 5 10**

**0**

**5**

**-5**

**time (s)**

**position (m)**

**0**

**5**

**10**

**0 5 10**

d. Determine the displacement from t = 3.0 s to 5.0 s using the velocity vs. time graph.

e. Determine the displacement from t = 7.0 s to 9.0 s using the velocity vs. time graph.

f. Determine the average **velocity** from t = 4 s to 8 s.

g. Determine the average **speed** from t = 4 s to 8 s.